Comprehensive Productivity and Staffing Study of Municipal Emergency Management and Fire Response Services

Prepared for

City of Troy, New York

February 2025

FINAL REPORT

Submitted by:

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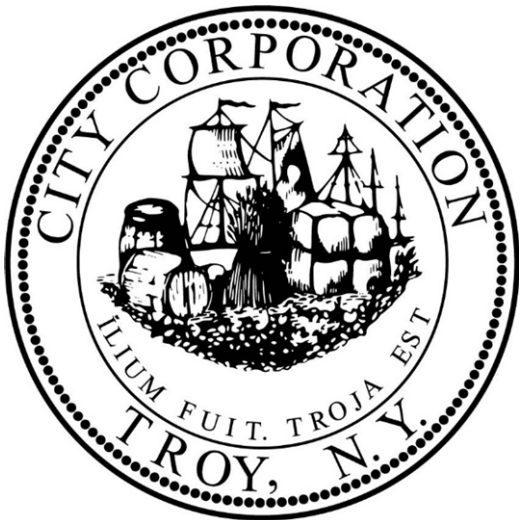

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February 2025

MANITOU INCORPORATED

DISCLAIMER

Manitou, Inc. is an independent company providing fire department and emergency services consulting services to local government and related entities. The company is not a subsidiary of any association or governing agency and does not present the following report work as representing the views and opinions of the Insurance Services Office (ISO), the National Fire Protection Association (NFPA), and the International Association of Fire Chiefs (IAFC). Often our work includes citing performance criteria of the above organizations or other entities, but only as commonly accepted best practices in the field of public fire protection and emergency services.

Any recommendations provided to our clients are not requirements and must be weighed and considered by local government when administering public policy. We strive to ensure our work is objective-based and any recommendations for improvements are vetted and balanced with each community's longstanding practices, culture, and political environment as well as budgetary constraints.

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1. EXECUTIVE SUMMARY

During late 2023, the city of Troy solicited proposals from qualified firms to provide consulting services for a Comprehensive Productivity and Staffing Study of Municipal Emergency Management and Fire Response Services. The objective of the study was to increase effectiveness by recommending to the city the optimal size and structure of the Troy Fire Department (TFD) to meet current and projected demands within a fiscally sustainable framework. The primary focus of the study was to provide the city with options for improved cost control and containment and increased efficiencies and effectiveness, while ensuring the fire department's organization is flexible and of the right size to be responsive to the evolving needs of the community.

Manitou, Inc. has documented a number of concerns for the future direction of fire and emergency medical services in the City of Troy. Unfortunately, as the city's population and economic fortunes declined, its capacity to pay for services was severely eroded. Historically, the TFD underwent a series of reductions in staffing, equipment, and facilities, most severely when the City's finances fell under supervision of the Municipal Assistance Corporation in 1995. The city emerged from this oversight with retirement of all debts in 2022. These cuts took their toll, as the city's insurance grading fell to a "3" when last reviewed in 2016.

The current structure of the TFD is the result of a series of compromises to maintain services. Most notably, this includes two of three advanced life support ambulances cross-staffed with fire apparatus personnel, meaning that the same crew moves between two pieces of apparatus depending on the nature of the alarm. Since 1996, on-duty staffing has remained steady at 24 personnel. During the intervening quarter-century, the demands for service have more than doubled, particularly for EMS transport. Consequently, calls for service increased from under 6,000 responses to over 13,000 in this same time period. What was acceptable in the 90s, has become inadequate over nearly 30 years of no significant change.

This current EMS and fire delivery model is showing severe stress as ambulances become increasingly busy, resulting in an effective reduction in firefighting capability. It must be emphasized that Troy continues to have a significant fire problem. The Department protects a city dominated by aged and historic blocks of buildings that present fire risks that were common in the late 19th century.

The Department has understandably emphasized maintaining services and its commitment to neighborhood-based fire stations, several of which are historic. Its administration was decimated, resulting in the Fire Chief being assisted by only two chiefs (an Assistant and a Deputy) who must manage service delivery, training, regulatory compliance, fire prevention, reporting, and apparatus maintenance. As an advanced life support service provider, EMS quality assurance and training requirements are handled as part-time duties by line officers. After many years of falling behind on apparatus replacement and facility maintenance, the Department has successfully begun to update its fleet and make repairs to stations.

Operationally, increasing demand for service is routinely stretching on-duty resources. Engine companies are staffed by three personnel, and ladder companies are staffed by two personnel, below levels accepted in national standards and in stark contrast to the hazards faced. Cross-staffed ambulances are effectively responding citywide on a regular basis, and simultaneous responses are common. Increasing ambulance workloads were met by creating a peak-hour ambulance, staffed using overtime funds. Activity levels are such that routine events such as on-duty training are increasingly difficult.

The difficulty in attracting paramedic-trained personnel is calling into question the sustainability of that model. The Department undertook to hire and train paramedics, which is a time-consuming and costly precedent. We offer moving to an Advanced EMT model as a path to maintain the bulk of clinical advantages while greatly reducing the amount of training required.

The report's recommendations are designed to enable the TFD to engage with collaborative problem solving and begin to manage its challenges, instead of focusing solely on responding to them.

The report recommends a plan for addition of on-duty staff to provide dedicated ambulance staffing and avoid cross-staffing of units; this would maintain or improve the level of service in the face of rising demand. This will be a costly undertaking, but will be necessary to preserve the quality of service.

Administratively, we recommend adding personnel to enable dedicated staff attention to fire prevention and code enforcement activities, freeing resources for high-level planning and development of enhanced performance measurement and reporting. The addition of a GIS/data analyst, in particular, will provide analytic support to all the Department's programs, and serve as a point of collaboration with other agencies and groups for collaborative problem solving.

In the future, Troy must address systemic and complex issues. For example, major challenges in EMS delivery are a national issue. The recent passage of state law to enable EMS units to receive Medicaid reimbursement for treatment without transport creates opportunities to reduce transports and increase revenue. The report contains numerous recommendations in the area of EMS, but we advocate for an expanded role of the TFD within the REMSCO and an expanded role for the Medical Director in supporting these efforts, in areas to include reducing hospital wait times, community paramedicine, and expanded automatic and mutual aid.

A major strategic opportunity is for greater cooperation and service integration between the City of Troy and Rensselaer County. At present, the city provides hazardous materials services to Rensselaer County, and the city pays the county an annual fee for dispatch services. This relationship should be deepened as the city stands as a resource to the county, and EMS service in particular is under stress. Similarly, the City of Troy hosts a number of county facilities, housing developments, and offices that drive demand for service.

A more reciprocal approach to cooperative service delivery could offer enhanced services to the county, and greater fiscal support for the existing and possible future capabilities within the City of Troy. Such efforts, such as expanding mutual aid availability for TFD ambulances into nearby areas of the county, could be a "win-win" by providing improved response in the county and bolstering the ability to TFD to provide service. Existing initiative, such as the county's new dispatch system and integration of Troy onto the county radio system, should be formalized and viewed in this broader context.

The report makes a number of recommendations. We do not expect that all the recommendations can be fulfilled based on local judgment, fiscal limitations, and staff time and attention. Nonetheless, we offer the following high-level prioritization of staffing recommendations as a guide for implementation. This summary is not exhaustive of every recommendation contained in the report, but emphasizes those we feel are of the greatest strategic importance.

Prioritized Staffing Recommendations

Given the acute need for field staffing, there is a tension between administrative and operational "on-duty" positions. Due to the challenges facing the TFD, we believe that administrative additions of staff will offer benefits with greater impact given limited resources.

Table 1: Prioritized Staffing Recommendations

Position	**Priority**
Hire Community Risk Reduction/GIS/Data Analyst	High
Create Fire Prevention Captain Position	High
Identify funding source to maintain peak-hour Medic Unit	High
Expand on-duty staff to enable dedicated staffing of Medic 1	Medium
Create full-time training officer position	Medium
Move to 3-person staffing on Ladder Companies	Medium
Add staff to enable a Command Aide to support the on-duty Battalion Chief	Medium
Expand on-duty staff to enable dedicated staffing of Medic 2	Mid-term
Monitor Medic Unit utilization patterns and set threshold for expansion of service	Mid-term

We recognize that this report identifies number of changes and investments that will require difficult choices. We recommend that the City form a "90-day Task Force" to review the report and recommend both a prioritized list of recommendations as well as identify a plan for

implementation. This Task Force should include members of the fire department administration, city staff, and representation of the firefighters' union.

ACKNOWLEDGEMENTS

Many individuals provided Manitou, Inc. assistance in conducting this report. This is important to mention as a report of this nature requires cooperation of all those involved. We are grateful for the assistance and cooperation from Troy city officials as well as Rensselaer County representatives for their willingness to share dispatch and operational policies and data. Special thanks go out to members of the Troy Bureau of Fire, in particular Fire Chief Richard Cellucci and his staff, for their cooperation and insight to the many challenges they face in providing the most efficient and effective fire and emergency medical services to the community they protect.

City of Troy

Office of the Mayor
Hon. Carmella Mantello, Mayor
Seamus Donnelly, Deputy Mayor and Chief of Staff
Hon. Wm. Patrick Madden, (former Mayor)

Bureau of Fire
Richard Cellucci, Fire Chief
Michal Kelleher, Assistant Fire Chief
Jared Barringer, Deputy Fire Chief
Michael Kelleher, Assistant Chief
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County of Rensselaer

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Other Agencies and Organizations
Hudson Valley Community College
Robert Phillip, Dir. Paramedic & Community Health Programs
Fire Chiefs and staff from surrounding Departments for providing data used in the report

2. INTRODUCTION

Background

Since 1997, the Troy Bureau of Fire (referred to in the report also as the colloquial "Troy Fire Department"), has provided paramedic-level Emergency Medical Services (EMS) transport services to the citizens of Troy. Over time, particularly in recent years, several societal factors have evolved that have adversely impacted the Bureau's ability to provide an acceptable level of emergency medical service, while maintaining an adequate and ready response force for the agency's original core mission of preventing, mitigating, and controlling the city's fire and associated risks. This dilemma is exacerbated by the level of fire risk in many of the city's districts and neighborhoods and the increasing demand of incidents that are emergency medical in nature. It is believed the primary societal factors impacting these services, including:

- the public utilization rate of 9-1-1 and local emergency departments as a primary source of healthcare;
- the downsizing of local hospital capacity;
- the declining interest in the profession of firefighting;
- the declining interest in careers in direct line health care (exacerbated by the pandemic); and
- the rapidly escalating cost to municipalities of maintaining Fire and EMS services.

Project Overview

Intent. The purpose of the study was to conduct a comprehensive productivity and staffing study of the Troy Bureau of Fire.

Objective. The objective of the study is to increase effectiveness by recommending to the city the optimal size and structure of the Bureau of Fire to meet current and projected demands within a fiscally sustainable framework. The study's evaluation is intended to determine and achieve the following benefits:

- enhancement of firefighter safety;
- enhancement of cost control and containment;
- increased efficiencies and effectiveness;
- identification of the right-sized organization to meet community needs;
- coordination and use of regional resources, with elimination of artificial boundaries and duplication of services, and;
- standardization of services and programs offered to the community with appropriate supporting capacity.

The study's scope of work included the following tasks:

- *Service Demand*. An analysis was conducted of the Bureau of Fire's historic and current service demand, including the number and type of incident by time of day and by individual fire stations.

- *Simultaneous Incidents*. The frequency of simultaneous incidents was analyzed, including when an engine company was placed offline (unavailable) due to EMS-related call demand and the resulting impact on firefighting and major impact capacity.
- *Duties and Responsibilities*. A review was conducted of the duties/responsibilities of on-duty officers and firefighters, including those assigned to staff positions and fire stations alike.
- *Work Schedule*. The current shift configuration was reviewed, particularly as it relates to the physical and mental risks to Fire Department members.
- *Use of 9-1-1 System*. A review was conducted of the public's increasing dependence on the Rensselaer County Bureau of Public Safety's 9-1-1 Emergency Communications Center and the potential effects on the use of the Fire Department's services, particularly on the delivery of emergency medical services.
- *Shift Demographics*. The city's population trends were reviewed, including shifts in age and wealth demographics and how demographic changes may impact the delivery of emergency medical services.
- *Hospital Capacity*. The capacity of local hospitals was analyzed with regard to their impact on the delivery and availability of emergency medical services.
- *Not for Profits*. A review of not-for-profits organizations in the community was conducted as they relate to their utilization of fire and EMS services.
- *New Developments*. Recent trends in the city's housing were reviewed, including the construction of several large-scale developments and the conversion of older building stock into residential uses.

Special Considerations

Service Projections. It is the intent of the study to provide the city a forward-looking analysis projecting what the demands will be on the Bureau in the coming 20 years. The projections are based on data and the Manitou Project Team's demonstrated understanding of trends in the healthcare industry that may affect the efficient delivery of emergency medical services.

Resources and Benchmarks. The study also included: risk(s) associated with the change(s); staffing needs, operations changes; and recommendations of proper staffing levels. In addition, the study provides a comparison and benchmarks of the Troy Bureau of Fire against applicable industry standards, best practices, and comparisons of similar fire agencies.

Special Note: The study was conducted within the context of the excerpt from the city's Request for Proposals:

"Related to the level of fire service provided is a local policy decision, there is no federal or state mandated staffing level. Communities have the level of service they can afford or which they choose to fund. This study is intended to capture whether the local policy decisions in Troy can be data-driven and how alternative deployment and staffing models might be beneficial to address current and projected needs."

Methodology

The study was conducted in three phases. First an extensive data request was delivered, followed by a brief kick-off meeting with the Mayor, Fire Chief, and Deputy Chief. The data produced by the city was analyzed on a preliminary basis, and a subsequent extended site visit with multiple team members took place.

The first site visit saw numerous meetings with city departments and engagement with the Mayor, Chief of Staff, and Renssalaer County Public Safety officials. Within the Fire Department, meetings were held with the Local 86 Union President, Local 86 Executive Board, all Chief Officers, the Medical Director, and administrative staff.

A survey of all Department employees was included as part of the study. This provided all members the opportunity for input. This survey received responses from about 70 percent of the Department.

Two subsequent visits were held over the course of the project to follow up on inquires and gain more insights into local conditions.

We used GIS and data analysis as part of our study and extensive data are presented in the report.

The findings are a results of reviewing data, interviews, research, and analysis of records provided.

The conclusions of the study are based on the judgment of Manitou, Inc. and its team of fire/EMS professionals, informed by industry standards.

The report offers suggestions for improving fire department operations, and recommendations for operational and staffing enhancements to enhance accountability, effectiveness, and maintenance of services in the environment of an increasing workload.

3. COMMUNITY SETTING

The City of Troy, New York is located on the western edge of Rensselaer County, on the eastern bank of the Hudson River. Troy is located just north of the state's capital of Albany and has close ties with the capital city as well as nearby Schenectady. The three cities form what is commonly referred to as the Capital District. Other bordering or nearby cities are Cohoes, Saratoga Springs, Hudson, and Rensselaer. The city was incorporated as a town in 1791 and in 1816 became a city. Lansingburgh, bordering the northern part of the city, was annexed in 1900.

Troy is the home of several colleges, including Rensselaer Polytechnic Institute. Founded in 1824, the school is credited as the oldest private engineering and technical university in the country. Other colleges include Hudson Valley Community College, Russell Sage College, and Emma Willard School. In recent years, the city has become known as a popular filming location due to its abundance of urban settings that reflect Victorian Era and other varieties of architecture.

The city was located at the cross roads of the nation's Industrial Revolution primarily due to the convergence of nearby waterways and a geography that supported water power, a main source for the Revolution's development. The city's growth made it the fourth wealthiest city in the country at the turn of the 20th Century. Its wealth spurred the construction of Victorian era neighborhoods and many of the homes of this era remain to this day.

The city has experienced three major conflagrations in its history, the first and one of the largest being the Great Fire of 1862. The fire burned over 75 acres of the city, destroyed 500 to 600 buildings, and killed eight of the city's citizens. The estimated dollar loss neared $3,000,000, equating to $72 million in today's dollars.

The city was known as the Collar City due to being, for many years, the nation's leader in shirt, detachable collar, and related textile industries. The industry flourished after the Civil War, bringing much wealth to the city. By the early years of the 20th Century the city was responsible for making ninety percent of the collars worn in the country. The textile industry remained one of the city's leading employers into the 1960s, but by the early 1990s much of the industry had either gone out of business due to a decline or change in styles or had relocated to southern states.

Prior to the Civil War, the city was the second largest producer of iron and steel in the country. After the war, the steel production industry moved further west to be closer to raw materials. The iron and steel manufacturing produced many products that were used throughout the growing country. This included the development of iron storefronts and steel structural elements that were used in the construction of many of the era's building facades, and allowed for a revolution in the way modern buildings were constructed.

Population

The city is within one of three major centers that comprise the Albany metropolitan statistical area, with a population of just over 1.1 million. The population has fluctuated over the decades; the city's highest population was 76,813 during the 1910 census. By the year 2000, the city's population had dropped 42 percent from the 1920 U.S. Census. However, since 2010, the city has seen a stabilization of population. This can be attributed to shifting cultural and societal norms where urban centers are becoming more desirable places to live, especially among younger generations just entering the workforce. Table 3.1 illustrates the changes in the city's population since 1910.

Table 3.1: City of Troy Population Trends, 1910-2022

U.S. Census	Population	Percent
1910	76,813	
1920	71,996	-6.3%
1930	72,763	1.1%
1940	70,304	-3.4%
1950	72,311	2.9%
1960	67,492	-6.7%
1970	62,918	-6.8%
1980	56,638	-10.0%
1990	54,269	-4.2%
2000	49,170	-9.4%
2010	50,129	2.0%
2020	51,401	2.5%

The impacts of population loss and outmigration of industrial employment created challenges well-known to urban centers in the northeast. The lasting impacts of these events will be discussed later in this chapter.

2020 Census. During the 2020 U.S. Census, the city's population was estimated at 51,414, an approximate three percent increase above that of 2010. The incorporated limits of the city consist of 11.06 square miles, of which 10.36 square miles consist of land, equating to a population density of roughly 4,960 inhabitants per square mile.

Housing and Living. The median property value in 2022 was $177,100. For the years 2021 through 2022, the median property value increased from $155,000 to $177,100, a 14.3 percent increase. The homeownership rate for the same years was 34.5 percent. The median household income is $54,837. In 2022, 34.5 percent of the housing units were occupied by their owner, which was an increase from the previous year's rate of 33.9 percent. Homeowners with mortgages comprised 64 percent of the total of owner-occupied homes. The highest median household income was $81,728, with $66,549 being the lowest in certain sections of the city.

Poverty. Twenty-three percent of the population are considered to live below the poverty line, a number that is higher than the national average of 12.5 percent. The largest demographic living in poverty are females 25-34, followed by females 18-24, and then males 18-24. The most common racial or ethnic group living below the poverty line is white, followed by black and two or more races.

Healthcare. Ninety-six percent of the population has health coverage, with 42.6 percent on employee plans, 29 percent on Medicaid, 10.7 percent on Medicare, 11.9 percent on non-group plans, and 1.67 percent on military or VA plans. Insured persons, distributed according to age ranges are: 20.7 percent under 18 years; 33.3 percent between 18 and 34 years; 32.7 percent between 35 and 64 years; and 13.2 percent over 64 years. By gender, of the total number of insured persons, 47.6 percent were men and 52.4 percent were women.

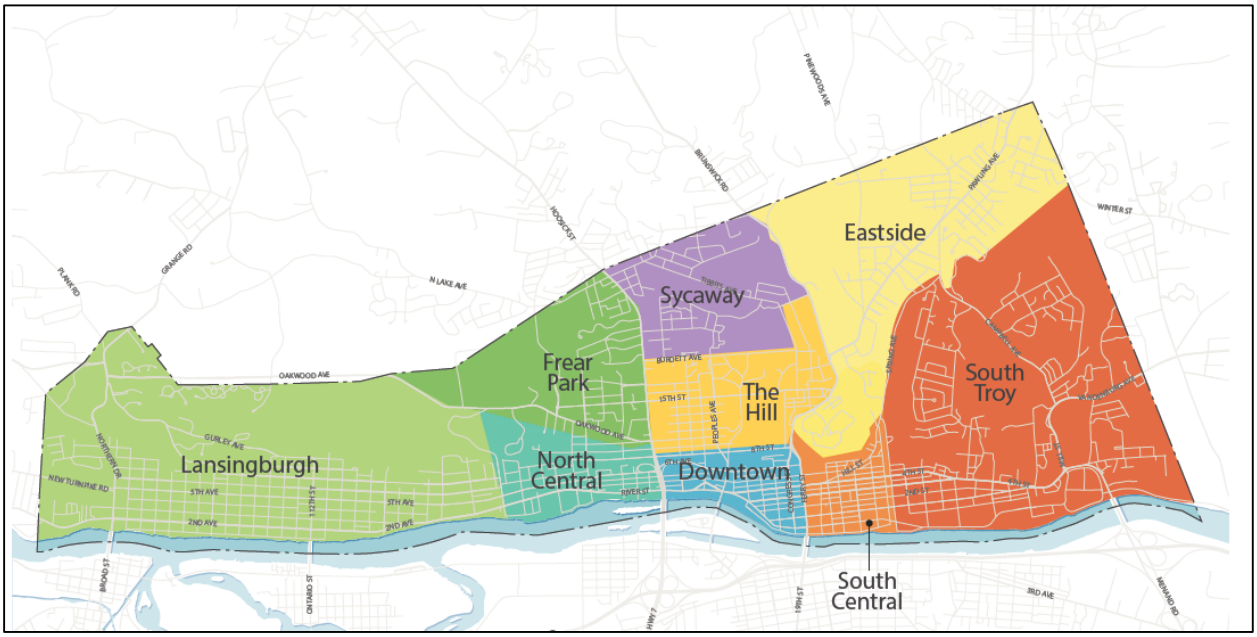
Economy. The city's economy employees roughly 23,000 people. The largest industries are health care and social assistance (3,233 people), educational services (3,194 people), and accommodation and food services (1,941 people). The highest paying industries are professional, scientific, and technical services ($68,558), utilities ($59,750), and manufacturing ($59,688).

Transportation. Sixty-four percent of workers drove alone to work, followed by those who worked at home (10.8 percent) and those who walked to work (8.35 percent). The city has an average commute time of 21.1 minutes. Car ownership is lower than the national average, with an average of one car per household.

Neighborhoods

Troy is a city of diverse neighborhoods. These neighborhoods vary greatly in size, population, density, demographic, and physical characteristics. While many of Troy's neighborhoods offer a unique historic character, a number of inter-related issues, including low household incomes, increased concerns about personal safety, and high vacancy rates, can impact the quality of life in neighborhoods.

Figure 3.1: Troy Neighborhoods



Structural Fire Risks. Much of the city's building and dwelling stock was constructed during the period leading up to World War II (early 1940s), with some areas such as the Downtown district being developed during the 1800s. These conditions, along with aging building and urban infrastructure, can pose a greater fire risk. Given the severity of the city's many risks, it would be wise for the Fire Department to sustain an ongoing multifaceted front to prevent, mitigate, and control fires and other risks.

Housing Conditions. The city's housing stock consists of many buildings that were built in the previous century or earlier. According to the city's Realize Troy Comprehensive Plan, sixty percent of the city's existing housing stock (about 14,000 units) was built before 1940, and only seven percent was built in 1990 or later. In comparison, approximately thirty percent of the four-county region's housing was built before 1940, and nineteen percent was built in 1990 or later. Many of Troy's neighborhoods struggle with a high proportion of owners who have neglected the care and maintenance of their properties and who are not concerned with neighborhood stewardship or adverse neighborhood conditions.

Historically, a high vacancy rate also has contributed to neighborhood destabilization. There are approximately 23,100 housing units; approximately 2,100 of these units, or 9 percent, are vacant and unused, though this number may have been somewhat reduced in recent years due to gentrification. In some cases, prospective residents are deterred from purchasing homes in neighborhoods with high vacancy rates as they are perceived as areas with higher crime, and where continued disinvestment may occur. These conditions have resulted in a weak housing market and low housing values compared to the region.

Housing Stock. Approximately sixty percent of the city's housing stock was constructed prior to the year 1940, with only seven percent being constructed since 1990. The remaining thirty-three percent could be considered as mostly suburban developments built during the post-war era of the last half of the last century.

The abundance of pre-war construction, mostly high-density detached frame homes, attached townhomes, and multi-story apartment houses, tend to experience a higher frequency of fires. This is primarily due to a number of factors, such as aging building systems, older heating units, and decaying electrical systems. In the event of a fire, occupants of these buildings are at greater risk of harm due to the quick spreading of fire, often caused by inferior design and materials. The city's large National Register Historic District is shown in Figure 3.2, below.

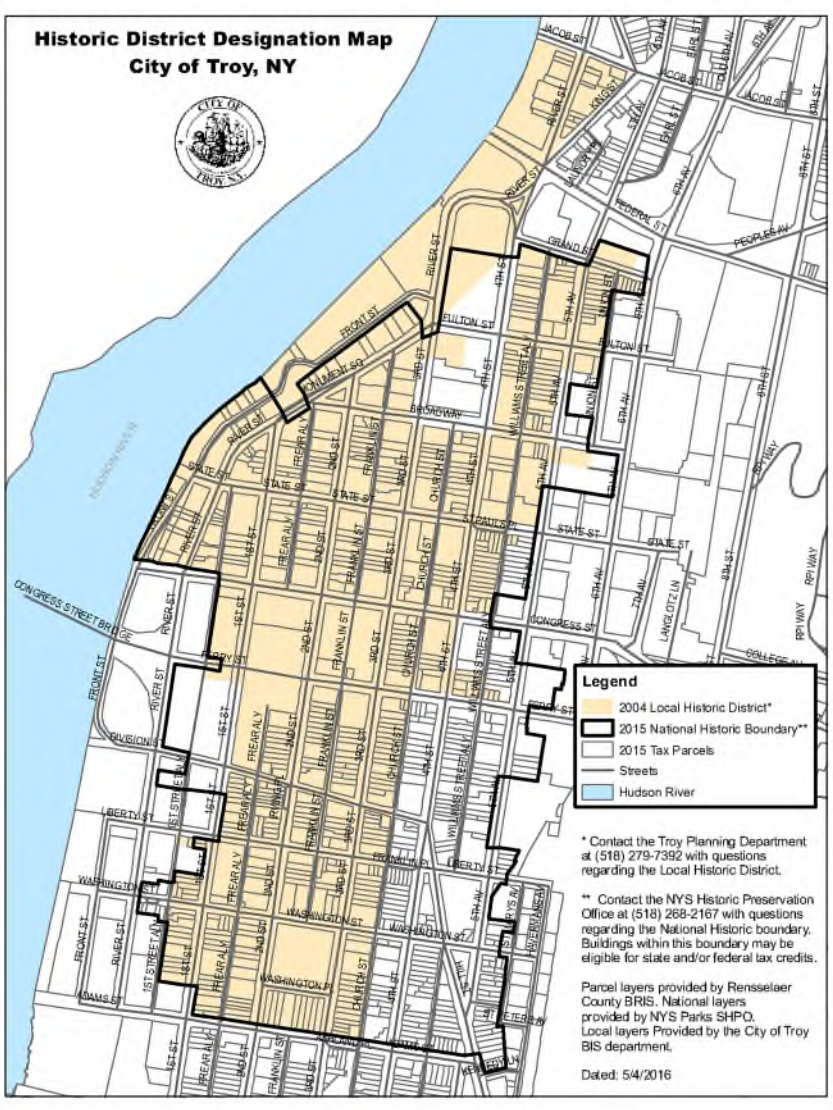

Historic District Designation Map
City of Troy, NY
Legend
2004 Local Historic District*
2015 National Historic Boundary**
2015 Tax Parcels
Streets
Hudson River
* Contact the Troy Planning Department at (518) 279-7392 with questions regarding the Local Historic District.
** Contact the NYS Historic Preservation Office at (518) 268-2167 with questions regarding the National Historic boundary. Buildings within this boundary may be eligible for state and/or federal tax credits.
Parcel layers provided by Rensselaer County BRIS. National layers provided by NYS Parks SHPO. Local layers Provided by the City of Troy BIS department.
Dated: 5/4/2016

Figure 3.2 Troy Historic District

These conditions place a greater demand on the Troy Fire Department to respond quickly and with sufficient staffing and resources to contain a fire before it spreads to neighboring structures and other exposures. With the exception of gentrification, these areas often have a greater EMS call volume due to an aging population and socioeconomic conditions.

Government Fiscal History

Form of Government. The city is governed by a mayor/council form of government. The executive branch, consisting of the mayor and their staff, serve as the daily administrators of the city government. The mayor oversees the administration of city services and programs under the city charter, including the enforcement of laws and ordinances. The executive branch serves as the manager of the city's executive departments, consisting of the Departments of Finance, Law, Public Safety, Public Works, Public Utilities, and Parks and Recreation. The position of mayor is a four-year term, with incumbents being prohibited from serving more than two consecutive terms. As part of their management responsibilities, the mayor serves as the supervisor over the Troy Fire Chief.

A six-member city council governs as the legislative branch and serves to enact laws and related legislation that relate to the governance of the city and its operations. Their duties include approving the annual budget and formally establishing public policy for the betterment of the city. The council conducts its business through regular and special called meetings. The council has the primary authority to review and approve the Fire Department's annual budget.

Annual Municipal Budget. The Office of the Comptroller serves as the city's finance administrator, overseeing the administration of the city's approved annual budget, fiscal transactions, and general accounting. The office oversees several city departments, including the Offices of the City Assessor, Civil Service, Purchasing, Treasurer, Payroll, Records Management, and Vital Records.

The city approached bankruptcy in 1995, leading to the appointment of the Municipal Assistance Corporation (MAC) for the City of Troy, an instrument under New York State law. The MAC oversaw the city's finances and secured funding to keep the city operating. This early period was marked by layoffs and major tax increases. The city emerged from oversight of the Municipal Assistance Corporation in June 2023, after having paid all debts it had accrued. The shadow of the MAC and the City's brush with insolvency looms over spending decisions to this day.

Socioeconomic Risk Factors

Fire risk is driven by a combination of building stock features and population. Troy is unique for its remarkably well-preserved building stock – regarded informally as one of the best in the United States. Older neighborhoods, characterized by block after block of structures dating from the 1800s, are common. In other neighborhoods, wood-frame rowhouses or multifamily

buildings are constructed with little or no clearance between neighboring buildings, enhancing the risk of fire spread.

Distressed Neighborhoods. Typically, distressed neighborhoods have an older housing stock, higher vacancy rates, and are areas of disproportionate renter occupancy and low to moderate income concentration. These target areas, with homes often owned by absentee landlords, also often have higher crime rates and quality of life issues, such as poor home maintenance and litter.

Many areas of the city are well-maintained and feature thoughtfully maintained and restored buildings with diverse uses. Even in these areas, the innate hazard of dense, combustible construction poses very real challenges.

Figures 3.3 through 3.5 show some of these conditions within the city. Structures such as these pose significant challenges for the fire service, and are well-known for facilitating fire spread. Older construction techniques may also require labor-intensive firefighting operations, necessitating large numbers of firefighters with the ability to assemble quickly to enact rescue, stop fire spread, and extinguish fires. Conditions in many parts of the city are as dense as many major older urban centers.

Troy also faces a significant ongoing fire problem.

Figure 3.3: A Vacant Townhouse (with TFD marking) near Downtown

Figure 3.4, 3.5: Vacant and derelict dwellings in Lansingburgh

Recent Development Trends

In recent years, the city has experienced an increase in the investment of new residential and mixed-use developments. The reuse of former factories, commercial buildings, and institutional facilities into residential units, both market value and fixed income, has taken placed throughout the city, but mainly in the vicinity of the downtown area and bordering neighborhoods. These high-density areas are prime for redevelopment due to the character of older multi-story building stock where shops, restaurants, and nightlife activity abound. The trend of new development has at times impacted the Bureau's delivery of fire and emergency medical services.

The city's 2018 report, Realize Troy Comprehensive Plan, states that:

> *As a result of the ingenuity and creativity of its citizens, Troy is experiencing a resurgence of people and businesses interested in being a part of Troy's success. Many are attracted to the city's rich cultural and architectural offerings, strong educational institutions, and burgeoning technology and maker spaces. To effectively sustain this momentum and reverse the effects of long-term population decline, a bold new vision, growth strategy, and development framework are needed to guide growth, change and transformation of the city over the next 25 years.*

The report further states that the city is almost completely built out to its municipal boundaries, with approximately fifty-seven percent of the land base being made of up non-tax generating uses. This includes public rights-of-way for streets, parks, cemeteries, institutions, and vacant residential lands. While twelve percent of the city's land base is identified as vacant residential area, much of this land lies on steep slopes and is not likely developable. Only forty-three percent of the total land base today is contributing to the tax base. Residential uses make up thirty-two percent of this total, and the remaining eleven percent includes commercial uses, the downtown core, and industrial and manufacturing uses. However, there are many opportunities for reinvestment, development, growth, and community revitalization in developed areas, through intensification or infill.

The above-mentioned plan has established a vision, strategy, and framework for this success. It is a blueprint for community transformation aimed at enhancing prosperity, community well-being, quality of life, and the opportunities the city offers its citizens. The plan identifies city-wide networks, systems, and policies to support the city's waterfront, fosters a thriving city center, and strengthens and promotes the city's diverse neighborhoods. It will also help focus and align public and private sector initiatives around a set of common goals aimed at becoming a more attractive and vibrant city with a distinct role within the region.

The city received a New York State *Downtown Revitalization Initiative* grant in 2021. This grant will bring $10 million in State funds into the downtown to catalyze additional growth and private investment. A number of recent positive trends include increasing home prices, reduced

residential vacancies, a decrease in the percent of city residents living in poverty, and an increase of 13.5 percent in downtown property tax base in the past five years.[1]

Work is ongoing for the city's planning and building departments as new requests for permitting increase. Areas of low activity properties have been redeveloped into high-density developments, which in turn can create an increase in call volume for the Bureau, particularly for those related to medical emergencies. Monitoring the rehabilitation of older structures into new uses, ensuring fire and life safety requirements are met, will be challenging. An increase in new high-density construction and the repurposing of existing structures will require the Fire Department to employ and dedicate a sufficient number of qualified personnel and resources to mitigate potential fire risks.

[1] City of Troy. *Official Statement Relating to $5,725,000 Public Improvement Bonds, 2024 and $5,469,528 Bond Anticipation Notes, 2024.*February 1, 2024, p. 8, 10.

4. TROY FIRE DEPARTMENT

The Troy Fire Department is an all-hazards emergency service agency providing fire, emergency medical and rescue services. These services include: fire prevention and fire suppression duties; paramedic-level ambulance services; physical rescue work such as responding to motor vehicles or industrial accidents; emergencies requiring specialized training such as rope or water rescue; and the release or spills hazardous materials.

History of Troy Fire Services

The first recorded of fire protection in or near Troy was in 1791, when Lansingburgh, then a separate village to the north of the city, purchased a “Philadelphia” style manually operated fire engine. Two years later, in 1793, a fire destroyed fourteen structures in Troy. Following the fire the community’s citizens appointed a superintendent to oversee the purchase of fire buckets and related tools for firefighting. A second fire in 1797 destroyed several businesses. The following year, the community incorporated into a village and purchased the first firefighting apparatus for the Village of Troy. By 1812, the village boasted of three fire companies, each with its own fire apparatus, serving a population of 4,200 citizens. In 1816, the village incorporated as a city and would soon reach a population of 5,600.

Adoption of Steam Apparatus and Early Conflagrations. Following a major conflagration in 1854, along with a growing lack of faith in the volunteer fire companies, the city’s businessmen banded together in 1860 to lobby for the purchase of a steam powered fire engine and the hiring of a steam engineer for its operation. Within two years, two more steam fire engines were in service and no sooner had they been placed into operation when an even large conflagration rocked the city. The fire broke out on May 10, 1862, and its wake over 500 structures were destroyed and eight lives were lost, totaling $3.9 million dollars in damage. In 1868, the city placed in service a municipal fire alarm system, including street corner pull boxes that were connected to each fire station gongs and bells of several neighborhood churches.

Annexation and Expansion of Paid Services. In 1901, the bordering Village of Lansingburgh was annexed by the City of Troy. The city’s population had increased to nearly 60,000 by 1905. The Department, since 1862, had been a combination paid and volunteer organization. In 1900, the fire companies were reorganized into the Bureau of the Fire Department under the oversight of the city’s Department of Public Safety. In 1905, the Department consisted of 63 paid career members augmented by just over 1,000 active volunteer members. The Department’s volunteer force operated with eleven engine companies, three hose companies, and two ladder truck companies, all of which were assigned from three to four paid members, depending whether the company was located in or near the downtown high-value district or outlying neighborhoods. The paid members were on continuous duty and each were assigned to one of the thirteen volunteer managed fire stations. During evenings, volunteer members supplemented the staffing by bunking in their member company station.

Dissolvement of the Volunteer Force. In 1919, the Department formed a squad company equipped with a new motorized chemical wagon. The company served as the Department’s specialty company while also serving as an engine company when necessary. Soon after, in 1922,

the Department became an all-paid agency when the Troy City Council disbanded the remaining volunteer fire companies. A year later in 1923 the Council approved the formation of a second platoon with firefighters working a 10/14 workday. In the summer of 1924, the last of the horse drawn engines and trucks were replaced by motorized apparatus. In 1959 a third platoon was authorized reducing the Department's workweek to 56 hours. Also, in 1959 the fire alarm telegraph system was removed and replaced with telephone boxes.

Into the Modern Era. By 1969, the Department had in service eight engine companies, one squad company, and three ladder truck companies. This was a reduction in force from 1955 when there were eleven engine companies in service. The number of stations had been reduced to seven, a decrease of three from the mid-1950s. The total number of uniformed officers and firefighters totaled 175 with shift personnel working an average of 48 hours per week. The stations were organized into two districts, each with an assigned Battalion Chief and Aide.[2] A fire prevention bureau existed and was staffed by two fire captains. On February 4, 1973 a fourth platoon was formed, reducing the workweek to 40 hours. Stations were reduced from 7 to 6 in the 1970s. The telephone boxes were removed from the street corners on February 15, 1982. In 1981 the staffing of the TFD was reduced to 140 personnel. Department began providing first responder emergency medical response, along with the closest fire company to augment the third-party ambulance service. This led the Department to begin providing advanced emergency medical transport service in the city beginning during the month of October of 1995.

Table 4.1 shows the history of TFD staffing in data supplied by a former union officer. The Table shows a decrease in staffing at the same time that calls for service and services provided have increased.

Table 4.1: Historic Troy Fire Department Staffing

Year	Total Authorized Headcount	Minimum Staffing
	170	
1978	166	
1989	140	28
1992		26
1996		24

- Information supplied by Gary Favro

[2] An Aide is a uniformed member of the department allocated to a Battalion or higher-ranking chief who is assigned to shift duty and provides administrative assistance to the chief, as well as logistical support during structure fires and other complex and fast developing multi-company operations under the incident command system. Many cities have retained the position to enhance fireground operations and firefighter safety.

History of EMS Provision

Mohawk and Empire Ambulance were the original EMS transport providers in the area. These private ambulance providers included Mohawk Ambulance Service and Empire Ambulance[3], which operated in Rensselaer County.

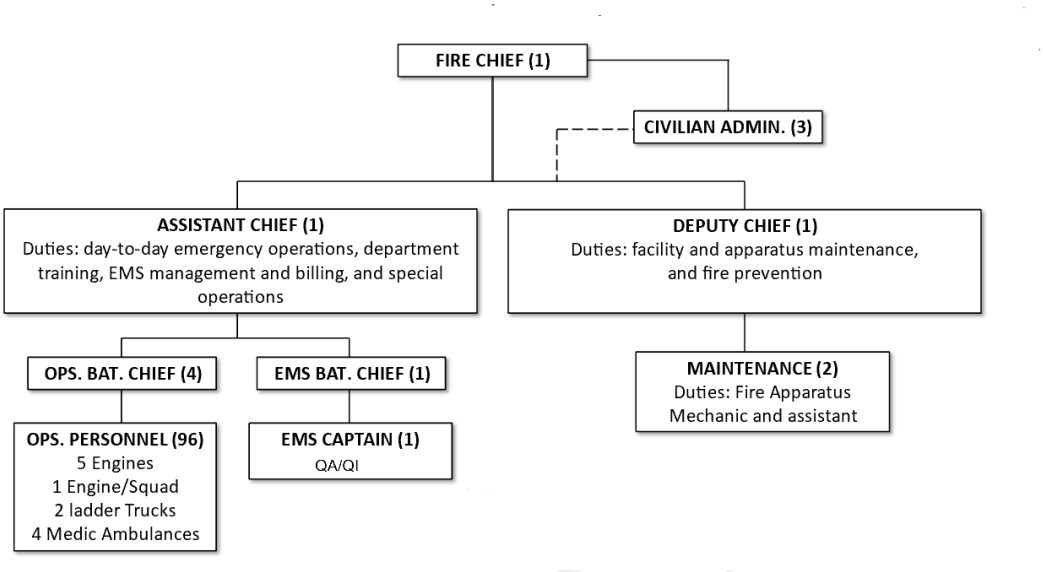
From the 1950's, until the mid-1970's, the Troy Fire Department provided basic first aid and rescue services, including vehicle extrication, as part of an ever-expanding mission. As emergency medical technician became the standard, Troy Fire Department soon began to incorporate more comprehensive medical training for its firefighters. These initiatives were facilitated or initiated by the firefighters' union in some cases. This enhanced their capability and capacity to provide pre-hospital care.

The Troy Fire Department took over emergency medical response in the city as a first responder agency at the basic life support level on April 1st, 1981. On October 9, 1995, the Troy Fire Department assumed emergency medical transport for all residents of the city as an advanced life support provider.

Current Organization

The Troy Fire Department is primarily organized into three major divisions, consisting of administration, operations, and support services (Figure 4.1). The divisions perform administrative and managerial duties for the department's many programs and services, as authorized by the city's administration and legislative body. Each of the three divisions is administered by a senior chief officer.

Figure 4.1: Troy Fire Department Organization and Staffing



[3] Empire Ambulance sold its license to Amblnz in 2023.

The following is a breakdown of each of the three divisions:

Administration. Administrative duties of the department are overseen and managed by the fire chief with three supporting civilian staff including a senior clerk and two accounting clerks. The fire chief and his staff carry out much of the department's daily clerical duties related to policies and budgetary tasks. The fire chief serves as the general manager and, along with their senior chief officers, set the department's goals in concert with established programs and services as authorized by the city administration. The chief and his cadre of senior staff serve as the primary leaders and managers of the department and coordinate closely with other city departments, as well as with the region's network of emergency service agencies. Civilian clerk personnel work in concert with the fire chief and provide administrative assistance to all uniformed officers assigned to administrative and support duties.

Incident Reporting. Fire departments should be responsible for planning and managing its operations so that firefighters can perform their roles of fire control and fire prevention most effectively and efficiently. The availability of accurate information about fires and other incidents is vital to achieving maximum performance. Patterns that emerge from the analysis of incident data can help departments focus on current problems, predict future problems in their communities, and measure their programs' performance.

The TFD records all fire, EMS, and other emergency incidents using the National Fire Incident Reporting System (NFIRS) by means of in-house software that interfaces with their dispatch system. In addition, EMS related incidents are also recorded using the state's pre-hospital care report. Incidents are recorded by the officer in charge of an incident or, when applicable, by the lead paramedic of medical-related response. It was reported there are, at times, an inconsistency in the level and accuracy of NFIRS reports.

Operations. The operations division is comprised of the officers and firefighters who staff the fire and EMS units in the department's six fire stations. The division is under the command of an Assistant Chief who is assigned to a forty-hour workweek and has overall management duties of the division's four 24-hour work shifts, or platoons. Each shift is under the command of a Battalion Chief who is responsible for all of the fire and EMS that are staffed. This consists of the following as shown below.

The TFD also provides hazardous materials response and specialized rescue support services to the entire county, using on-duty personnel and specialty apparatus housed at Headquarters.

Table 4.2: Troy Fire Department Operations Division On-Duty Staffing

Station	Unit/Company	Staffing				
		Chief	Capt.	Lt.	FF.	Total
Station 5 (Central Station)	Car 4 (Battalion Chief)	1				1
	Engine/Squad 1		1		2	3
	Truck 2			1	1	2
	Medic 4			1	1	2
Station 1	Engine 1		1		2	3
	Truck 1/Medic 1			1	1	2
Station 2	Engine 2/Medic 2		1		2	3
	Medic 3†				2	2
Station 3	Engine 3		1		2	3
Station 4	Engine 4		1		2	3
Station 6	Engine 6		1		2	3
Total		1	6	3	15 (17)	25 (27)

† Staffed only during peak demand from 8 a.m. to 8 p.m.
( ) Indicates staffing during peak demand

Support Services. The Deputy Fire Chief provides a series of support services, including overseeing the maintenance and upkeep of the Department's stations, apparatus, and equipment. The Department's civilian apparatus mechanic and their assistant work directly under the Deputy Chief. Much of the training is developed and delivered by members of the senior officer staff; most of the training is delivered through computer-based instruction. Though useful as a tool for knowledge retention, its use as the primary delivery of training is limited, especially when a portion or all the training requires a combination of knowledge retention and motor skills. This is inherently evident when ensuring personnel must be well versed in the hands-on skills of structural firefighting, vehicle extrication, and hazardous materials response. Officer and firefighters must continuously practice their skills by conducting outdoor individual and multi-company drills. A training program that mostly consists of computer-based training will fall short of the need for all personnel to possess an adequate level of knowledge, skills, and abilities for safe and effective operations.

Allied Municipal Services. The Department maintains regular communication and coordination with other municipal agencies, most notably the Bureau of Code Enforcement, Department of Housing and Community Development, the Department of Planning, and the Personnel Department.

City of Troy

Bureau of Code Enforcement. The bureau administers the city's building construction, permitting, and housing inspection programs. Under these programs the bureau is responsible for the enforcement of all state codes and local codes as well as the city's zoning ordinance. Typical

services include the issuance of building permits, construction and housing inspections, vacant building inspections, and issuance of certificates of occupancy and compliance.

Department of Housing and Community Development. The department administers the U.S. Department of Housing and Urban Development (HUD) entitlement programs for the city which include the approval of community development block and emergency solutions grants, oversight of the home investment partnerships program, and similar Federal funding programs that provide funding to vulnerable populations.

Department of Planning. The department is responsible for the planning, development, coordination, and promotion of the physical, social and economic well-being of the city. The department serves as staff and adviser to the city's planning and historic commissions, the zoning board of appeals, and facilitates the development and administration of the city's comprehensive plan. The department also serves as an advisor to the city's industrial development authority, the local development corporation, and the capital resource corporation.

Personnel Department. The personnel department administers the city's appointment, benefits, and promotion of employees. The department oversees the policies and procedures for the administration of fire department civil service exams for appointment and promotion.

Fire Scene Investigation. The bureau, through the fire coordinator, staffs a team of certified fire investigators who assist in determining the cause and origin of a fire and explosions. The investigators document, log, photograph, interview, research and gather all the necessary information for use at court proceedings, law enforcement investigations and/or FOIL requests. They coordinate with Troy Police, who maintain responsibility for criminal investigation and evidence processing.

Policies and Procedures

The TFD is managed through the use of departmental issued policies and procedures that address the scope of services and programs provided. This includes specific procedural policies that address fire, emergency medical, rescue, and special operations. Supporting polices include administration and management, personnel, training and certification, and fire prevention-related services.

Programs and Services

Fire Prevention and Mitigation. A primary role of the modern fire department is the proactive and holistic approach to managing local fire and related risks. Generally, this is done through a comprehensive program of prevention and mitigation. Specific tasks conducted by prevention personnel include a formal ongoing assessment of risks, coupled with the collection and analysis of incidents and associated losses. The analysis is a continual review of historic losses whereby the questions of who, what where, how, and why may be answered. From this analysis, programs may be implemented that best addresses the community's specific needs related to fire and injury prevention and related prevention initiatives. In conjunction with the above risk assessment, fire

prevention and mitigation programs and services include: fire code adoption and enforcement, including the inspection of new and existing buildings; permitting of the storage and use of flammable liquids and similar hazards; new building and development plans review; fire safety education; and fire scene investigation.

Currently, only one member of the department is regularly assigned to fire prevention-related duties. The Deputy Fire Chief (Car 3) is assigned to code review, which is incidental to their regular duties of overseeing the Department's facilities and apparatus. This level of focus appears to be inadequate for a city the size of Troy, particularly given the recent trends in building construction. At a minimum, daily fire code enforcement should have regularly assigned day staff that are certified and trained in managing and carrying out these duties, including pre-construction plans review, routine inspection of existing buildings (particularly target hazards such as schools, hospitals, nursing homes, theatres, etc.), and permitting of hazardous services.

Another concern is the limited resources available to devote to preventive concerns, such as vacant buildings mitigation and public fire and life safety education. The Department has only a minimal number of prevention programs and while vacant buildings are managed, with much of the work falling to on-duty fire company personnel (which is very positive for awareness purposes), a need for additional focus in this area is apparent.

Fire Suppression. The Department protects an interesting and diverse array of buildings, most of which are set within a high-density pre-war[4] urban setting. The age and level of density of dwellings and other buildings present many challenges for the Department, particularly the immediate exposure to neighboring buildings. Without an ample number of resources in personnel and equipment, fires in high-density areas can quickly escalate to the involvement of several buildings. These conditions stress the need for the Department, while working with limited resources, to prioritize (with the Building Department and other allied municipal agencies), fire prevention and mitigation services to reduce potential fires in the high-density areas of the city. In addition, the Department responds to fires in a host of outside properties, such as brush and grass, vehicles, and similar incidents involving watercraft and waterfront properties. The firefighting force consists of an on-duty Battalion Chief, five 3-person engine companies, one 3-person rescue squad/engine company and two 2-person ladder truck companies.

Emergency Medical Services. The Department serves as the city's primary provider of paramedic level emergency medical services including medic ambulance transport. The department staffs one medic unit full-time, and two others that are cross staffed with personnel from either an engine or ladder truck company. One additional ambulance is staffed by off-duty members who work overtime. Typically, a medic unit and the nearest engine company respond to medical-related emergencies.

Local Providers. In March of 2024, the Division of Local Government and School Accountability of the Office of the New York State Comptroller, published a report: *The Growing Role of Counties in Emergency Medical Services*. The report stated that the state's

[4] Pre-war refers to dwellings and other buildings built prior to the Second World War.

emergency medical services are provided by an assortment of public and private entities that may be may be funded by local governments, users of the service, insurance, or a combination of these and other revenue sources. Providers range in level of service from emergency medical technicians (EMTs) to paramedics, who may serve in hourly, salaried, or volunteer positions.

Table 4.3: EMS Agencies by Owner Type and Staffing Structure, 2022

Provider	Paid	Volunteer	Combination	Total	Percentage
Local Government	67	192	86	345	34.9%
City	22	0	3	25	2.5%
County	11	0	1	12	1.2%
Town	32	13	13	58	5.9%
Village	2	65	21	88	8.9%
Fire District or Company	0	114	48	162	16.4%
Corporation	112	295	221	628	63.5%
For Profit	75	5	10	90	9.1%
Not-for-Profit	37	390	211	538	54.4%
Other (State, Federal, Sole Proprietor)	15	0	1	16	1.6%
Total	194	487	308	989	100%

Source: 2024 Report, *The Growing Role of Counties in Emergency Medical Services*
Note: Some of these (such as the five for-profit volunteer EMS agencies) appear to be misclassified. Includes New York City.

The above Table 4.3 indicates that roughly forty percent of cities serve as the primary EMS provider within their community, many of which are fire department-based. Most of these services are provided by paid personnel with only three of the twenty-five services being staffed by volunteer personnel.

Funding. Regarding funding for services, the report stated:

> *". . . within the state of New York, ambulance services treat and transport patients regardless of their insurance coverage (if any) or ability to pay with many EMS agencies cover all or part of their expenses by billing for services. This process is, however, often complex and can be difficult to administer, and it requires a sophisticated billing process and a customer base sufficient to pay for costs. Until recently, some types of municipal EMS agencies could not bill at all. Municipalities may also use property tax and other municipal revenue sources either to fund their own EMS agency or to contract with a private agency that provides ambulance or other emergency medical services. Many volunteer fire companies also use fundraising to support operations."*

Level of Service. The report provides an overview of the level of emergency medical service provided throughout the state. As seen in Table 4.4 below, the TFD's current paramedic-level of service is part of the 7,538 paramedics registered in the state as of 2022. The number of the state's paramedics for that year made up roughly 23 percent of the total number of licensed EMS providers. The figure indicates an interesting trend in the number of paramedics where the

number was reduced from just over 10,500 in 2019 to 7,538 in 2022. This equates to a 29 percent reduction over the four-year period.

Table 4.4: Active EMS Practitioners in New York State, 2019-2022

	2019	2020	2021	2022	% Change 2019-22
Emergency Medical Technician (EMT)	27,063	20,563	24,939	23,412	-13.5%
Advanced EMT	1,325	1,276	1,549	1,462	10.3%
EMT - Critical Care	1,074	914	723	610	-43.2%
Paramedic	10,584	7,257	7,495	7,538	-28.8%
Total	40,046	30,010	34,706	33,022	-17.5%

Source: 2024 Report, The Growing Role of Counties in Emergency Medical Services
Note: Active practitioners are defined as those whose license numbers appear on patient care records.

NOTE: Advanced EMT Critical Care is a program no longer offered in New York State. They are maintaining the certifications of those currently certified but the program has not been offered since 2018.

Special Operations. The Department is trained and equipped to provide technical rescue operations requiring specialized training and equipment. This includes high-angle rope rescue, confined space rescue such as cave-ins, and water-based rescues such as those encountered during flash flooding or boating accidents. For releases or spills involving hazardous materials, the department serves as one of the regions primary technician-level responders.

Emergency Management. Along with other city departments, the Bureau serves as a primary player in the preparation and activation of disaster and emergency management plans. The Fire Chief, or another member of the senior staff, serves as the Bureau's liaison to the Rensselaer County Department of Public Safety's division of emergency management. The Bureau serves as one the city's primary representatives to the County Multi-Jurisdictional Hazard Mitigation Planning Committee.

Personnel Management

Civil Service Commission. The appointment and promotion of all uniformed and non-uniformed personnel are under the oversight of the Troy Civil Service Commission. The Commission is established under the laws of the state and consists of three Commissioners who each serve a six-year term. The City's Personnel Officer serves as the Executive Secretary to the Commission.

The Commission may establish local rules and requirements for appointment and promotion of fire department personnel; however, the policies must not be in conflict or less stringent than related state laws. There are no requirements for testing of new hires or promotions, instead tests are administered on an as-needed basis. The duties of the Troy Civil Service Commission are managed through an adopted rules manual whose purpose is to provide an orderly and uniform

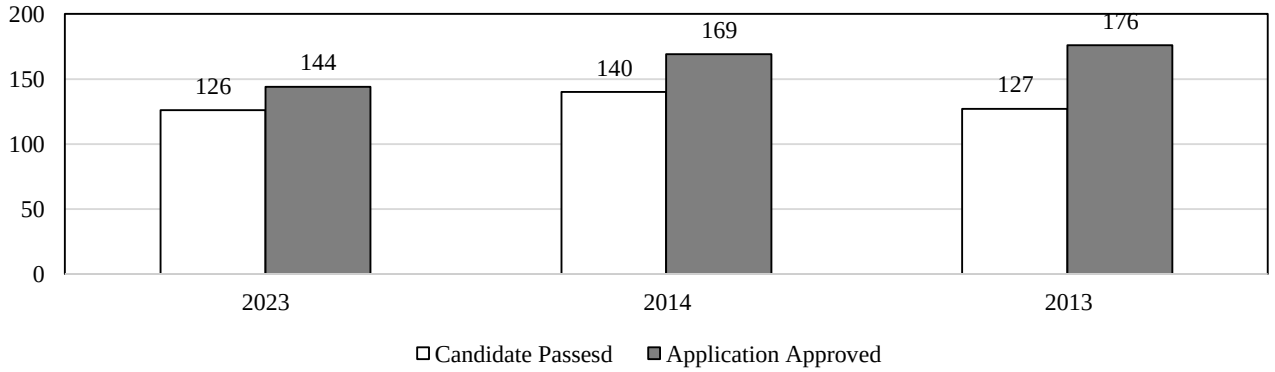
system for the administration of civil service on a basis of merit and fitness, as provided by state law. Fire Department testing is administered through the office of the New York State Civil Service Commission.

Firefighter candidates undergo a competitive exam consisting of the following:

a. Written examination
b. Physical agility test
c. Interview (top two)
d. Physical exam/background
e. Psychological test
f. Appointment

The below Figure 4.2 provides an overview of firefighter candidate performance for the three most recent civil service tests.

Figure 4.2: Firefighter Candidate Exam Performance, 2013-2023



New firefighters are placed on an 18-month probationary period following their appointment. Prior to 2023, new appointees were required to hold a paramedic license from the state of New York, but this policy was dropped in part due to recruiting challenges brought on by the COVID pandemic and changing social norms. Exams are given to qualified candidates who compete for promotion to a higher rank and includes a one-year probationary period. There is no formal performance review given as part of the promotional process.

Labor Agreements. The city and the firefighter's labor organization, Local 86 of the International Association of Fire Fighters, have in place a contract agreement that establishes terms and conditions of employment and working conditions. The core of the contract addresses the following:

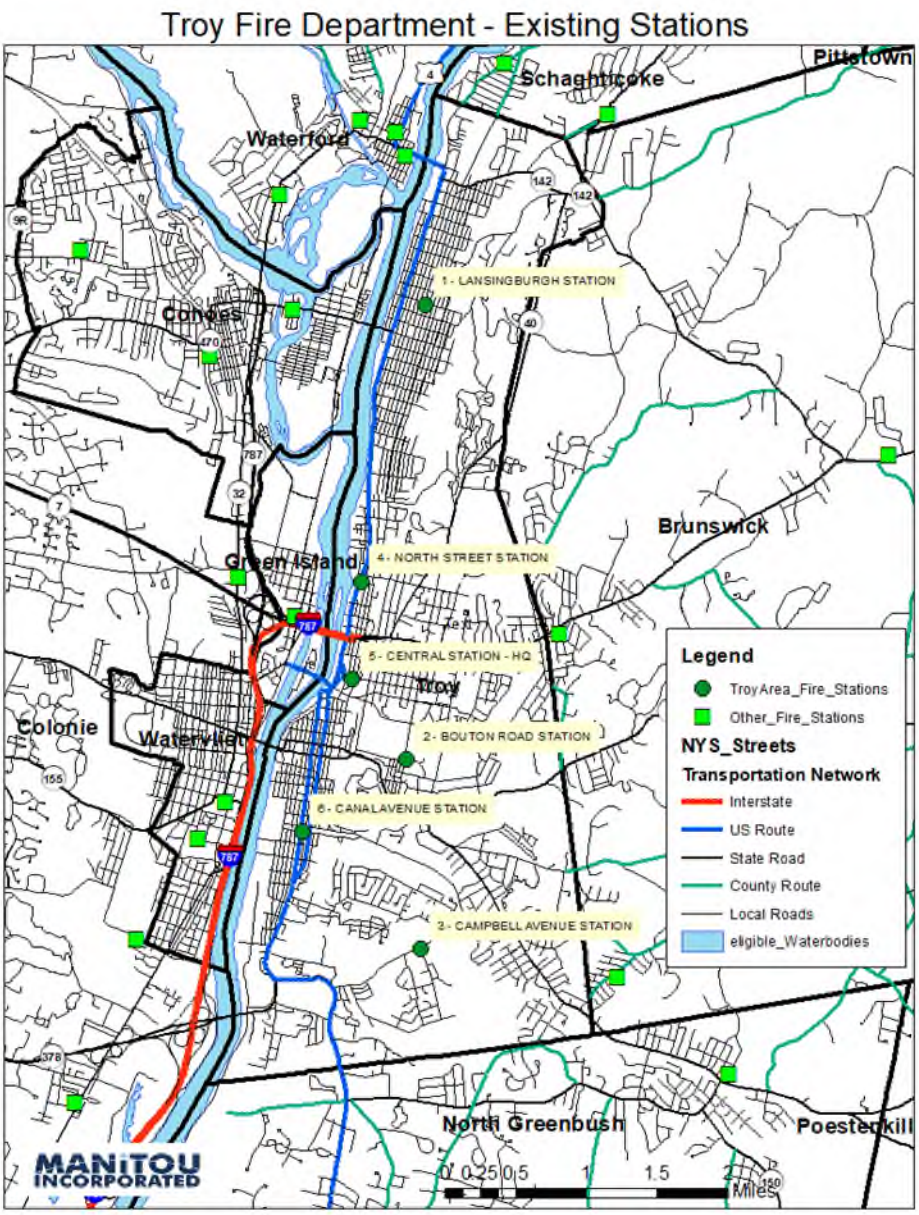
- Contract Administration and Procedures
- Rights of Employees
- Management Rights and Responsibilities
- Grievance Procedures

- Work Hours and Staffing
- Seniority
- Health Insurance and Related Benefits
- Retirement Plan
- Probationary and Permanent Employees
- Leave Benefits
- Wages and Out of Grade Work
- Uniforms

The original period of performance for the contract was for the years 2013-2016, but currently remains in effect.

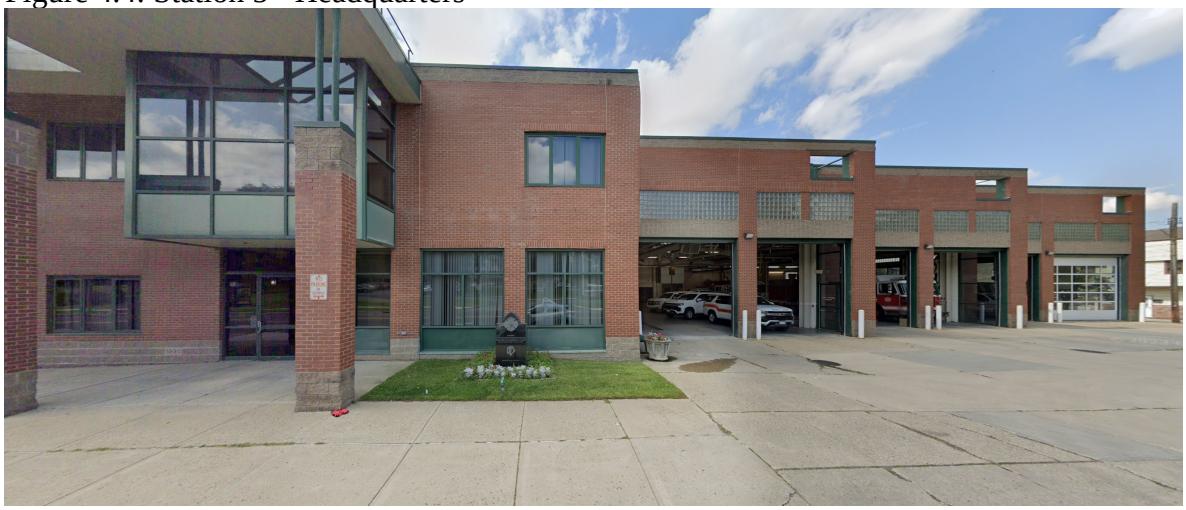
Stations and Apparatus

Stations. There are six fire stations currently in use that house the Department's staffed fire companies and medic units. Stations vary in age the oldest being placed in service in 1886 to the newest being constructed in 1995. They are shown in Figure 4.3 below.



Central Fire Station (Station 5). This station was opened in 1995 and serves as the Department's headquarters (Figure 4.4). The station is appropriately located in the downtown business district. Facilities include: offices of the Fire Chief and their administrative staff; training facilities, including a classroom for instruction; and living quarters for on-duty personnel, including a Battalion Chief and company officers and firefighters assigned to staffed apparatus. The total number of administrative staff include four uniformed officers, including the Fire Chief and three civilian clerical staff. The current number of personnel on-duty per shift consist of seven officers and firefighters and one Battalion Chief. The station has the capacity to house, at a minimum, eight on-duty shift personnel and is equipped with six exiting apparatus bay doors. The station is provided with ample space for a downtown station for a city the size of Troy.

Figure 4.4: Station 5 - Headquarters



Fire Station 1. Constructed in 1969, the station houses and engine company and a ladder truck company that cross staffs a medic unit (Figure 4.5). During an onsite visit, it was reported to the Manitou team that the station was originally constructed to serve as a temporary facility and is currently slated to be replaced by the city. Given the age of the station, the design and original construction materials, the station, if feasible from an architect's standpoint, is in dire need of substantial upgrades or complete replacement either at the current site or an adjacent lot. The station is provided with three existing apparatus bay doors which, at a minimum, should be retained during any future upgrades or complete replacement.

Figure 4.5: Fire Station 1

This station is currently in the planning phase for replacement. We concur on the need to *replace Fire Station 1 either at or in close proximity to the current 5th Avenue site. At a minimum, the station should be designed with 3-4 bays large enough to house the current fire companies of an engine and ladder truck, as well as a separate staffed medic unit. The station should be designed to modern station design standards, including a bay area large enough to house reserve or auxiliary apparatus.*

Fire Station 2. Station 2 (Figure 4.6) was constructed in 1977 and serves the Hill and Sycaway neighborhoods. The station includes two apparatus bays and houses an engine and two medic units. Staffing includes a company officer and two firefighters who cross staff Engine 2 and Medic 2. A second ambulance, Medic 3, is housed at the station and is placed in-service by off-duty personnel assigned overtime between the hours of 8 a.m. and 8 p.m. The station's condition and grounds appear to be in good condition and adequate to house up to two fully staffed fire companies. The station is approximately 9/10th road miles from the Central Fire Station,

located on 6th Avenue. The station is provided with two existing apparatus bay doors, the minimum considered acceptable for modern station design standards.

Figure 4.6: Fire Station 2

Fire Station 3. Located in the East Troy neighborhood, Fire Station 3 (Figure 4.7) houses Engine Co. 3, including its three-member crew. The station was constructed in 1975, when the department implemented a plan for the consolidation of several stations that were in use during the days when fire steamers and hose wagons were drawn by horses or during the early days of motorized apparatus. The station was designed to house the Department repair shop where it

continues to service apparatus under repair. The station is provided with two existing apparatus bays.

Figure 4.7: Fire Station 3

Fire Station 4. The facility is the second oldest fire station in the city being constructed during the era of horsedrawn apparatus oof the late 1800s. The station (Figure 4.8) has undergone several upgrades, the most notable in 1936 as part of the federal governments' Work Progress Administration Program (WPA). A more recent upgrade occurred in recent years. The station serves the North Central, Frear Park, and vicinity neighborhoods. The station houses Engine Co. 4 and crew. The station is approximately 8/10th road miles from the Central Fire Station located on 6th Avenue. The station is provided with only one apparatus bay door.

Figure 4.8: Fire Station 4

Fire Station 6. The facility is the oldest station (Figure 4.9) currently in service by the Fire Department. The station was constructed in 1889 as the quarters of one of several volunteer fire companies protecting the city at that time. The station houses Engine Co. 6 and its three-member crew. The station underwent renovations in recent years, but due to its age has limited function as a modern fire and EMS facility. An addition in the rear of the station provides for the storage of reserve or surplus apparatus and equipment. The station is approximately 1.3 miles from the Central Fire Station located on 6th Avenue. The station is provided with only one apparatus bay door.

Figure 4.9: Fire Station 6

Table 4.5 below details the Troy Fire stations and unit assignments.

Table 4.5: Troy Fire Stations and Unit Assignment

Station #	Built/ Renovated	Condition/ Sprinklered	Address	Assigned Staffed Units	Auxiliary
Central (Stat. 5)	1995	Good/Sprinklered	2175 6th Ave.	Car 1 (Fire Chief) Car 2 (Asst. Chief) Car 3 (Dpty. Chief.) Car 4 (Bat. Chief) Squad 1 (Engine) Truck 2 Medic 4	Marine 1 (boat) Boat 1 Res. Squad 2 (reserve) Engine 7 (reserve) Medic 14 (reserve) HazMat 50 Collapse Vehicle
Station 1	1969	Poor/Not Sprinklered	115th & 5th Ave	Engine 1 Truck 1/Medic 1†	Medic 11 (reserve)
Station 2	1977	Good/Not Sprinklered	Bouton Rd. & 15th St.	Engine 2/Medic 2† Medic 3 ††	Engine 9 (reserve)
Station 3	1975	Good/Not Sprinklered	530 Campbell Ave.	Engine 3	Engine 8 (reserve) Lad. Truck 3 (reserve)
Station 4	1927	Fair	North St. & River St.	Engine 4	
Station 6	1889/ 2023	Fair/Not Sprinklered	Canal Ave. & 3rd St	Engine 6	
Dept. Shops	See Staton 3	See Station 3	530 Campbell Ave.		

† Cross staffed
†† Staffed only during peak hours from 8 AM to 8 PM

Apparatus. Fire department vehicles include heavy fire apparatus, ambulances, a fleet of SUVs and other light vehicles, and watercraft such as fireboats. Table 4.6 below provides an inventory of the department's fleet of emergency and support vehicles:

Table 4.6 Troy Fire Department Apparatus Inventory

Unit	Station	Type	Status	Make	Year	Comments*
In-Service						
Engine 1	1	Pumper	In-Service	Rosenbauer	2019	1500/750
Engine 2	2	Pumper	In-Service	Amer. LaFrance	2003	1500/750
Engine 3	3	Pumper	In-Service	Pierce	2009	1500/750
Engine 4	4	Pumper	In-Service	Rosenbauer	2020	1500/750
Engine 6	6	Pumper	In-Service	Rosenbauer	2021	1500/750
Squad 1†	5	Pumper	In-Service	Sutphen	2016	1500/500
Truck 1	1	Aerial Truck	In-Service	Sutphen	2006	1500/300/95'
Truck 2	5	Aerial Truck	In-Service	Sutphen	2024	1500/300/95'
Medic 1		Ambulance	In-Service	Ford/PL Custom	2022	
Medic 2	2	Ambulance	In-Service	Ford/Braun	2017	
Medic 3	2	Ambulance	In-Service	Ford/Braun	2018	
Medic 4	5	Ambulance	In-Service	Ford/Braun	2023	
Car 1	5	Staff Car	In-Service	Chevy Tahoe	2020	Chief of Dept.
Car 2	5	Staff Car	In-Service	Chevy Tahoe	2020	Assist. Chief
Car 3	5	Staff Car	In-Service	Chevy Tahoe	2022	Deputy Chief
Car 4	5	Staff Car	In-Service	Chevy Tahoe	2022	Shift Bat. Chief
Car 5	5	Staff Car	In-Service	Chev. Suburban	2003	Staff Bat. Chief
Car 6	5	Staff Car	In-Service	Chevy Tahoe	2015	Support Capt.
Car 7		Staff Car	Reserve	Chevy Tahoe	2007	
Car 8		Pickup	Reserve	Chevrolet	2002	
Car 11		Staff Car	In-Service	Dodge Charger	2014	Administration
Car 81	6	Staff Car	In-Service	Chevy Silverado	1999	Mechanic
Service Truck	6	Work Van	In-Service	Ford/Braun	2003	Converted Amb.
Reserve						
Engine 7	5	Pumper	Reserve	Pierce	1987	1250/1000
Engine 8	3	Pumper	Reserve	Amer. LaFrance	1999	1500/750
Engine 9	2	Pumper	Reserve	Amer. LaFrance	1999	1500/750
Truck 3	3	Aerial Truck	Reserve	Sutphen	2012	1500/300/95
Squad 2	5	Pumper	Reserve	Amer. LaFrance	2003	155/500
Medic 6	6	Ambulance	Reserve	Ford/Horton	1997	
Medic 11	1	Ambulance	Reserve	Ford/Braun	2015	
Medic 14	5	Ambulance	Reserve	Ford/Braun	2015	
Auxiliary Vehicles						
Marine 1	5	Fire/Res. Bt.	In-Service	Stanley	2018	32' craft
Boat 1	5	Fireboat	Reserve	Boston Whaler		

* Pump capacity in gallons per minute/on-board water capacity/aerial device height
† Standard pumper with additional compartment space for special tools for rescue operations

Rescue Squad. The rescue squad company is equipped with a standard engine apparatus with a pumping capacity of 1,500 gpm. In addition, it has the standard onboard water tank capacity of 500 gallons and is equipped with additional compartment space for the storage of specialized rescue tools. The company can provide fire suppression and well as serving as the department's primary rescue vehicle. The squad is assigned a still district[5] for fire related responses, including automatic fire alarm activations in the downtown district, and is included on all initial responses to motor vehicle accidents with entrapment, technical rescues, and other emergencies requiring a greater response of equipment and staffing. The apparatus is designed with additional compartment space to accommodate special tools for the extrication of people trapped in automobile collisions, industrial accidents, and a variety of emergencies requiring specialized recue tools and equipment.

Average Age of Apparatus. In recent years the replacement of fire apparatus has been challenging for the TFD. Since the disruption of manufacturing and supply chains due to the Covid-19, the construction of new apparatus may be as long as 18-24 months. Table 4.7 below provides an overview of the age of TFD's apparatus.

Table 4.7: TFD Apparatus Inventory by Years In-Service

Apparatus Type	In Inventory	Oldest	Newest	Average Years of Service
In-Service Engine*	6	2003	2021	9
Reserve Engine	3	1987	1999	29
In-Service Ladder Truck	2	2006	2012	15
Reserve Ladder Truck	1	1987	-	37
In-Service Ambulance	4	2017	2023	4
Reserve Ambulance	3	1999	2015	15
In-Service SUV/Staff Car	6	2003	2022	7
Reserve SUV Staff Car	4	1999	2014	21

* Includes engine/squad apparatus

X

Deployment

The Department uses a tiered deployment system whereby the number and type of fire and EMS units are initially dispatched based on the type and nature of a call. Table 4.8 provides a basic overview of deployment protocols, including minimum staffing for each assignment. It should be noted the protocols serve as a guide for dispatchers, with the understanding that in some cases the initial assignment may have to be modified or reduced due to call volume and unit availability.

[5] A geographic area around a fire station that serves as the company's primary response area, including responses requiring only one apparatus, i.e., vehicle or dumpster fires, etc.

Table 4.8: Troy Fire Department Deployment by Incident Type

	Type and Number of Units (Initial Dispatch)						
	Engine	Rescue	Ladder	Chief	Medic	Special	Staffing
Reported Fire							
Building box alarm	3	1	2	1	1		19
Still Alarms (Non alarms of fire)							
Dwelling alarm (no fire)	1						3
Animal rescue				1			1
Assist a person	1						3
Assist police				1			1
Commercial alarm	1						3
Sprinkler alarm	1	1	1	1			9
Fires reported to be out	1						3
Gas or other flammable odor	1						3
Water leak related	1						3
Wires down	1						3
Other Fires							
Rubbish, brush, grass, etc.	1						3
Gas grill fire	1	1		1	1		9
Boat fire	1	1		1	1	Mar. 1	9
Hazardous Material Sill/Lease							
HazMat release – in city	1	1		1	1	HM50	9
HazMat release – outside city	1	1		1	1	HM50	9
Automobiles							
Fire or leak of fuel	1						1
Accidents/injured person	1				1		5
Enhanced accident (MVC)	1	1		1	1		12
Alpha/Bravo Response	1				1		5
Car lock-in (no danger)	1	(1)					3
Car lock-in with medical	1	1		1	1		9
Bomb Threat							
Bomb Threat	1		1	1			6
Carbon Monoxide							
Alarm only	1	(1)		1			4
With symptoms	1	1		1	1		9
Confined Space Rescue							
In city	2	1	1	1	1	HM50	14
Outside city	1	1		1	1	HM50	9
Electrocutions							
With injuries	1	1	1	2	1		12
Elevator Rescue							
No injuries	1	1		1			7
High Angle Rescue							
In city	3	1		2	1		16
Outside city	1	1			1		8
Poestenkill Gorge	3	1	1	3	1		18
Suicide attempt (high places)	1	1	1	1	1		11
Investigation							
Fire investigation	1						3
Life or Limb Endangered							
With possible injuries	1	1	1	2	1		15

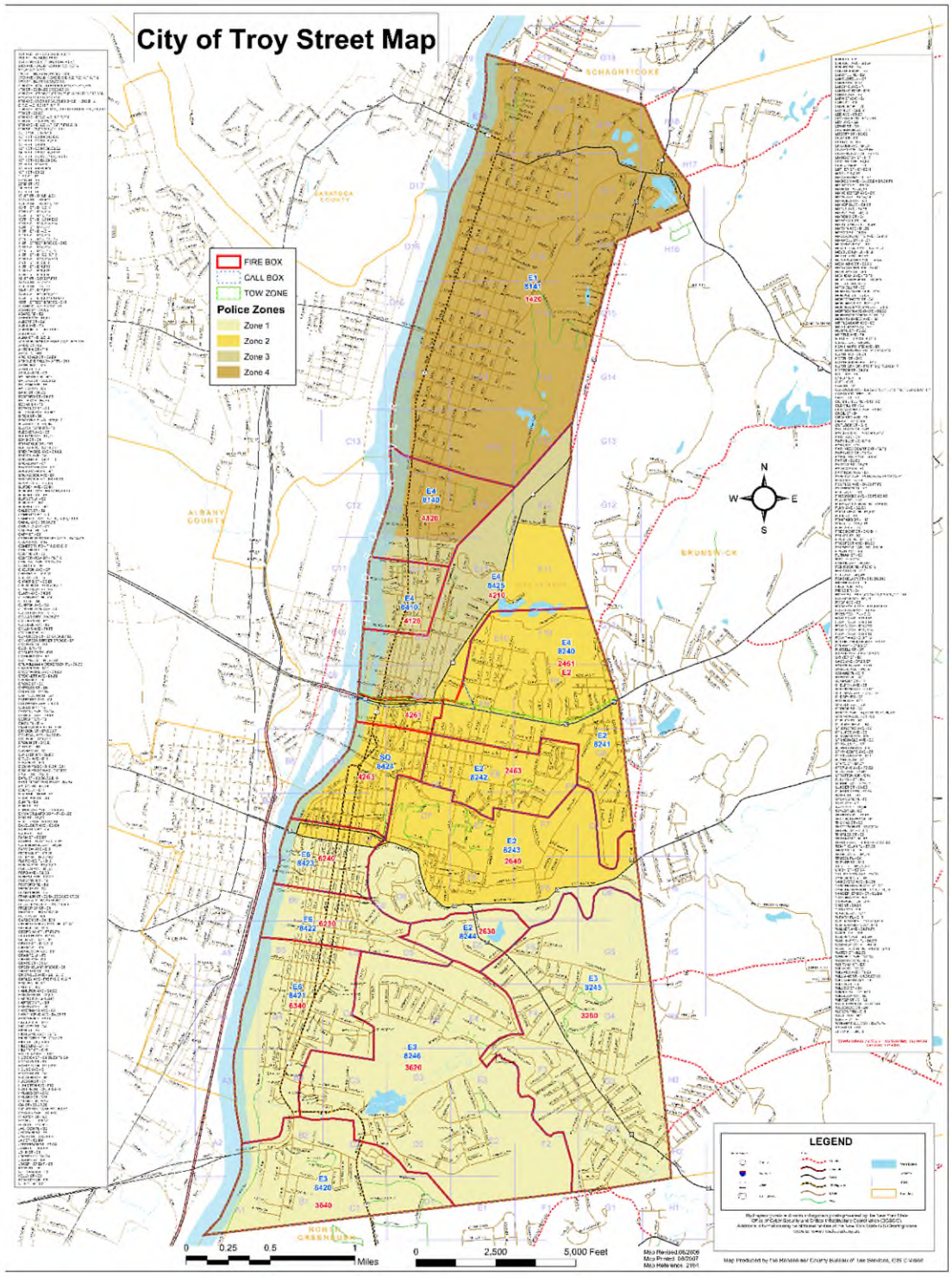
Lockouts							
Emergency	1						3
Non-emergency	1						3
Vehicle – emergency	1						3
Medical Emergencies							
EMS call	1				1		5
Echo determinant	1	1			1		8
Trauma	1	1		1	1		9
Confirmed death	1				1		5
Lifting assist	1						3
Private transport	1						3
Psychiatric	1				1		5
Overdose	1	1		1	1		9
Mutual Aid Requests							
EMS				1	1		3
Structure fire							
Watervliet	2		1	1			6
Green Island (2nd alarm)	2			1			7
Cohoes (2nd alarm)	2			1			7
Albany	1			1			4
Refrigerator Calls							
Non-emergency	1						3
Water Rescue							
Water/Ice/Bridge jumper	1	1		1	1		9

Ref: TFD Assignment and Response S.O.P.

x

Box Assignment Polygons. The TFD utilizes a box assignment for still and multi-company responses. The city is divided into 14 geographic areas, or boxes, for dispatching fire companies and medic units. Each box is given an assigned still response (single unit) engine company and medic unit, and the number and sequence of units assigned to multi-company responses. The terminology is a holdover from the days when the primary method of notifying the TFD of a fire or other emergency was via street corner fire alarm boxes. Today's modern computer-aided dispatch systems, such as the one used by the Rensselaer County 9-1-1 dispatch center, provides an enhanced capability where every address in the city may be programmed with the same response protocol without mentioning a box or similar geographical term. The below Figure 4.10 illustrates the 14 geographic box locations.

Figure 4.10: TFD Fire Alarm Map



Certification and Training

Fire

The level of competency and abilities of personnel is paramount to the Department's capability to deliver efficient and effective services. Furthermore, the understanding and adherence to command structure and safe operational practices reduces accidents to both the public and the fire department personnel. Certification and ongoing training, both in the classroom and on the drill ground, is the bedrock to emergency scene operations.

Programs and Policies. Effective fire department training programs should be formally adopted with supporting and accessible written policies that clearly define the program's goals, objectives, and expectations, as well as pertinent administrative and managerial details. The program should reflect the community environment being served and be relevant to the mission and scope of service of the individual fire department.

Certification. Generally, for each rank within a fire department there are minimum certifications that personnel must meet. For the beginning firefighter this equates to certification of basic skills and any required additional qualifications such as emergency medical technician or paramedic. These additional certifications may vary from one community to the next based on local needs and/or preferences. When a member is promoted to a higher rank it is common practice to require additional certifications, such as when a member assumes the role of apparatus driver. This position requires special skills in addition to those for basic firefighting, such as driving large and heavy equipment and operating high pressure pumps and hydraulically operated aerial ladders. Officers are required to retain certification commensurate to the level of responsibility within the organization.

Training. A firefighter's training should not stop with their initial certification. Instead, the skills obtained should undergo a constant refresher, including the practice of hands-on motor skills and drills, to ensure a cohesive operating environment exists on the scene of a fire or other emergency where coordination and teamwork is paramount. Basic competency skills and recertification are normally conducted on an annual cycle, but no greater than 18-months. Training may be conducted through classroom or table top exercises in conjunction with hands-on exercises in the field or at a training facility.

The TFD does not currently have a formal training policy that provides direction for command staff or company officers. However, some training, primarily paramedic refresher, is conducted on-line via Vector Solutions, a vendor that provides on-line fire/EMS training services. Battalion chiefs and company officers also take initiative to conduct in-house training in fire stations or in a station's primary response district. The use of the Rensselaer County Emergency Servies Training Complex, located on Macha Lane in bordering Wynantskill, is an option.

The department's training initiatives face many challenges. This includes a lack of a formal program policy, minimum full-time focus on the management of training initiatives, and an

insufficient amount of time for on-duty fire companies to conduct training given the excessive daytime call volume, primarily due to EMS duties.
Most training initiatives are under the direction of the Assistant Fire Chief who, due to other duties, can only commit roughly 50 percent of their time to training. It was reported that, at one time, the Department had a full-time training officer. For a department the size of the TFD, it is common to have at least a training officer and one assistant.

Certification requirements are limited to the minimum required by the New York State Office of Fire Prevention and Control. Entry-level firefighters must achieve Firefighter I and II certificates during their initial training, per state requirements. Apparatus drivers must hold certificates for driving and operating pumper and ladder truck apparatus. Company-level officers (Lieutenants and Captains) must hold Officer I and Instructor I certifications. There are no required certification requirements for the rank of Battalion Chief or higher, though some officers hold officer-level certification greater than Officer I. There are no requirements for officer candidates to have any level of college education or enrollment in courses of the National Fire Academy or equivalent.

EMS

The New York State Department of Health, Bureau of Emergency Medical Services and Trauma Systems (BEMSATS) plays a crucial role in overseeing and regulating local emergency medical service (EMS) providers. The Bureau's responsibilities ensure that EMS providers operate within a framework of established standards and regulations, thereby maintaining high-quality emergency care throughout the state (New York State Public Health Chapter 45, Article 30, Section 3000).

BEMSATS establishes and enforces the regulatory framework that governs all EMS providers in New York State. This includes setting statewide standards for training, certification, equipment, and operational procedures. By providing a consistent regulatory environment, BEMSATS ensures that all EMS providers adhere to uniform practices, thereby enhancing the quality and reliability of emergency medical services.

One of the primary functions of BEMSATS is to certify EMS personnel, including emergency medical technicians (EMTs) and paramedics. The Bureau develops and approves the curricula for training programs, ensuring they meet the necessary educational and practical standards. Additionally, BEMSATS oversees the certification process, which includes initial certification, recertification, and continuing education requirements. This ensures that all EMS personnel are adequately trained and qualified to provide emergency medical care.

BEMSATS conducts regular inspections of EMS agencies, ambulances, and equipment to ensure compliance with state regulations and standards. These inspections are crucial for maintaining the safety and reliability of EMS operations. BEMSATS has the authority to enforce corrective actions and, if necessary, impose penalties or suspend operations of providers that do not comply with established standards.

BEMSATS works closely with the Regional Emergency Medical Services Councils (REMSCs) to coordinate EMS activities across different regions of the state. REMSCs act as local extensions of BEMSATS, facilitating communication and implementation of state policies at the regional level. This collaboration ensures that regional variations and specific needs are addressed while maintaining overall compliance with state regulations.

The Department is responsible for collecting and analyzing data related to EMS operations, patient outcomes, and trauma systems. This data is used to monitor the effectiveness of EMS services, identify areas for improvement, and inform policy decisions. By analyzing trends and outcomes, BEMSATS can implement evidence-based improvements to enhance the quality of emergency medical care statewide. Data collected at the state level is then submitted to the federal government through National Emergency Medical Services Information System (NEMSIS).

BEMSATS provides support and technical assistance to local EMS agencies to help them comply with state regulations and improve their services. This includes offering guidance on best practices, providing resources for training and development, and assisting with the implementation of new technologies and procedures. The Bureau's support is essential for local EMS agencies, particularly those facing resource constraints or other challenges.

The Department plays a critical role in preparing for and responding to disasters and mass casualty incidents. BEMSATS develops and implements statewide emergency response plans, conducts training exercises, and coordinates with other state and local agencies to ensure a unified and effective response. In the event of a disaster, BEMSATS mobilizes resources and provides oversight to ensure that EMS providers can deliver timely and effective care.

The New York State Department of Health, Bureau of Emergency Medical Services and Trauma Systems is integral to the oversight and regulation of local EMS providers. Through its comprehensive regulatory framework, certification and training programs, inspections, regional coordination, data analysis, and support services, BEMSATS ensures that EMS providers across New York State deliver high-quality, reliable, and effective emergency medical care. This oversight not only maintains the integrity of the EMS system but also ensures the safety and well-being of the residents who depend on these critical services.

Section 3003 of the New York State Public Health Code (New York State Public Health Chapter 45, Article 30, Section 3003) delineates the establishment, structure, and responsibilities of Regional Emergency Medical Services Councils (REMSCs) within the state. The law mandates the creation of these councils by the state commissioner, with a cap of eighteen councils, each formed through applications from local organizations knowledgeable in emergency medical services (EMS). These applications must detail the geographic area to be served and include nominees for council membership.

Treatment protocols in New York State for both basic life support and advanced life support providers are peer-reviewed and evidenced based treatments. They are disseminated by the New York State Department of Health, Bureau of Emergency Medical Services and Trauma Systems.

The councils are tasked with advising the State Emergency Medical Services Council and the Department of Health on various EMS-related issues, aiding in regional coordination, and implementing EMS programs and training. The councils have a broad array of powers, including acquiring property, making by-laws, entering into contracts, conducting studies, and collecting fees for services.

The REMSCs operate as regional extensions of the NY State Department of Health's Office of Emergency Medical Services (OEMS). This relationship is pivotal in ensuring that state-level EMS policies and regulations are effectively implemented and tailored to regional needs. The OEMS provides oversight, guidance, and funding to the REMSCs, which in turn offers localized input and coordination for EMS delivery.

The New York State Department of Health's Office of EMS is the central regulatory body overseeing EMS operations across the state. It establishes statewide standards, protocols, and regulations to ensure a consistent and high-quality EMS system. REMSCs, acting under the guidance of the OEMS, play a critical role in localizing these regulations to fit regional contexts. This collaboration ensures that state policies are both practical and effective at the regional level.

REMSCs advise the OEMS on specific regional needs, which might include adjustments to training programs, resource allocation, or the implementation of new EMS technologies and practices. They are also responsible for developing and executing regional EMS training plans, recommending training course sponsors, and assisting with disaster medical care coordination. Local EMS agencies, including municipal fire departments and private ambulance services, interact closely with REMSCs to ensure compliance with state regulations and to receive support and coordination in delivering EMS. REMSCs facilitate communication between local agencies and the OEMS, ensuring that local challenges and needs are addressed in state-level planning and policy-making.

REMSCs also provide technical assistance and support to local EMS agencies, especially those operating under exemptions from standard staffing requirements. This support includes volunteer recruitment, management training, and efforts to help these agencies meet uniform standards. By doing so, REMSCs helps maintain a robust and efficient EMS system that can adapt to local conditions while adhering to state-wide expectations.

The regulatory and oversight functions of the REMSCs are multifaceted and critical to the integrity of the EMS system in New York State. REMSCs are empowered to approve regional medical advisory committee nominees, coordinate regional EMS programs, and make determinations of public need for new EMS and ambulance services. This regulatory framework ensures that EMS operations are well-organized, adequately staffed, and responsive to the needs of the communities they serve.

Furthermore, REMSCs have the authority to grant exemptions from staffing standards, provided there is a demonstrated need and a plan for achieving compliance. This flexibility allows REMSCs to support local agencies facing staffing challenges without compromising the quality of care.

The REMSCs, under the guidance of the NY State Department of Health Office of EMS, play an indispensable role in the regional coordination and regulation of EMS in New York. By bridging the gap between state regulations and local implementation, REMSCs are charged with ensuring that the EMS system is both standardized and adaptable, capable of meeting diverse regional needs while maintaining high standards of care.

TFD EMS Medical Director

The medical director for Troy Fire Department performs the obligatory responsibilities for purchase of controlled substances, medications, syringes, needles, etc., in addition to responsibilities expected by BEMSTS, as per Title 21 of the United States Code under the Controlled Substances Act and New York State rules and regulations: Public Health Law, Article 133, §3381; Title 10 - NYCRR, Part 80; Title 10 - NYCRR, Part 80.131; and NY State Public Health Chapter 45, Article 30.

The medical director comes in once a week to discuss quality issues and educational initiatives. The department utilizes quality assurance to spearhead training and identify issues for resolution. The department uses Vector Solutions to provide the bulk of training for the members of the department.

There is an incredible opportunity for the department to be proactive in their approaches. In general, medical directors for EMS play an important role in ensuring that pre-hospital emergency medical care is delivered in a timely and effective manner. They provide medical oversight, develop protocols and policies, and work closely with EMS personnel to ensure that they are providing the highest quality of care to patients.

Successes in EMS can be measured in a variety of ways, such as improved response times, increased survival rates for certain medical conditions or traumatic injuries, improved patient outcomes, and successful implementation of new treatment protocols or technologies.

Avedis Donabedian said that Patient + Structure + Process = Outcomes. Quality is improved by measuring and modifying the process and structure, not sifting the output to identify failures that need to be reworked or thrown away. Philip Crosby's statement of the same principle said: The system for causing quality is prevention, not appraisal. Currently Troy utilizes retrospective analysis for quality assurance. These mechanisms (chart review) are finding mistakes after they happen.

Retrospective analysis is not meant to be a singular mechanism for quality assurance, but rather to demonstrate that the prospective and concurrent measures for quality assurance and improvement that have been implemented are working.

Recall

Periodically, the Department requires the recall of off-duty personnel to augment on-duty personnel at major emergencies or to staff reserve fire apparatus or medic units. The following is an overview of the agreed upon recall policy as set forth in the agreement between the city and the firefighter's Local 86 association:

The employer recognizes its obligation to utilize fully the service of its own firefighters in situations which may also require outside assistance under the Mutual Aid Program. Recall of off-duty firefighters and officers shall be placed in operation before or simultaneously with issuing any Mutual Aid call. The following procedures shall be put into effect in the event that recall of Fire Officers and Firefighters becomes necessary.

1. In the event of a third alarm fire or depletion of all on-duty personnel, there shall be an automatic re-call. Recall shall be by shift seniority on the non-contiguous shift. A minimum of six (6) firefighters will be recalled. All recalled members will be entitled to a minimum of four (4) hours' pay. The Chief of Fire or the Assistant Chief in the absence of the Chief shall make the determination that public safety requires the recall of additional personnel. Upon any recall, the Deputy or Battalion Chief shall effect notification of the employees as needed. If a Firefighter is not immediately available, he/she shall be skipped over. If the recall is ordered less than four (4) hours before the end of the duty shift, the platoon to be the one that would normally have reported at the change of shifts, otherwise the platoon to be recalled shall be the non-contiguous platoon. A record shall be maintained of each Firefighter recalled, showing whether or not the employee reported for duty. A copy of such record shall be provided to the Association without delay.

2. Such Firefighters and Officers shall be selected in the manner provided in Section "1" by seniority.

3. An Officer or Firefighter scheduled for vacation, absent because of work-related disability, or who has reported sick, shall not be subject to recall.

4. In the event that the Chief of Fire or Assistant Chief in charge decides that the situation requires more men than available in the two (2) platoons, he/she may call additional employees of either of the remaining platoons as, in his/her opinion, the circumstances may require. All of the terms and conditions set forth herein shall be applicable to the recalled employees in that platoon.

5. In the event that the Troy Fire Department personnel are dispatched outside of City limits the Chief or the Assistant Chief (or the Battalion Chief in their absence) shall recall an equal number of firefighters as are committed to the scene of mutual aid.

Mutual Aid

Generally, mutual aid is defined as a written intergovernmental agreement between two or more agencies and/or jurisdictions that they will assist one another on request by furnishing personnel, equipment, and/or expertise in a specified manner. Mutual aid is considered to be on a case-by-case basis and not automatic.

The TFD receives or provides mutual aid to neighboring communities on a case-by-case basis subject to approval of the on-duty Battalion Chief. When requesting aid into the city, the Department only utilizes nearby fire departments that are staffed by career firefighters.

Table 4.9: TFD Mutual Aid Received and Given, 2022-2023

2022			
EMS Received		EMS Given	
North Greenbush EMS	39	Town of Brunswick - Brunswick #1	1
RPI EMS	45	Town of East Greenbush - Clinton Heights	1
Sand Lake EMS	2	Colonie EMS	4
Mohawk EMS	38	Town of East Greenbush - East Greenbush	1
Nassau	1	Town of Schaghticoke – Pleasantdale	1
Colonie EMS	47	Town of North Greenbush – Wynantskill	2
Fire Received:		Fire Given:	
Albany	1	Albany	3
Cohoes	2	Watervliet	1
Green Island	1		
Watervliet Arsenal	6		
Watervliet	1		
2023			
EMS Received		EMS Given	
Hoosic Valley	1	Town of Brunswick - Brunswick #1	1
North Greenbush EMS	32	Colonie EMS	10
RPI EMS	101	Town of North Greenbush – DeFreetsville	4
Mohawk Ambulance	82	Town of Grafton – Grafton	1
Colonie EMS	58	Town of North Greenbush – Wynantskill	2
Fire Received:		Fire Given:	
Cohoes	4	Albany	4
Watervliet Arsenal	7	Cohoes	1
Watervliet	8	Green Island	1
		Watervliet	4

Capital District Mutual Aid Consortium. The Department is a member of a regional mutual aid pact that consists of the fire departments of Albany, Cohoes, Troy, Watervliet, Green Island, and the Watervliet Arsenal. The agreement comprises operational protocols, including incident command and standard operating procedures. Each participating city has established within the agreement the number and type of mutual aid resources per alarm; e.g., 2nd alarm, 3rd alarm, etc. (Figure 4.11).

Figure 4.11: City of Troy and Bordering Rensselaer County Fire and EMS Districts

Troy—Box 420

- Initial Alarm
  - TFD Units as per SOP
- **Second Alarm (200, 400 & 600 Box)**
  - Two Engines
    - Troy Engine
    - Watervliet Engine
  - One Truck
    - Watervliet Arsenal Truck
  - Chief
    - Troy Car
- **Second Alarm (100 Box)**
  - Two Engines
    - Troy Engine
    - Cohoes Engine
  - One Truck
    - WAFD Truck
  - Chief
    - Troy Car
- Third Alarm
  - Two Engines
    - Albany Engine
    - Albany Engine
  - One Truck
    - Albany Truck
  - Chief
    - Albany Car

Automatic Aid. Unlike mutual aid, automatic aid is a formal agreement adopted between two or more fire departments for immediate joint response on initial alarms or to fill in in the event the primary unit is unavailable. The main purpose for this form of aid is the optimum utilization of the closest available fire or EMS, regardless of their governing jurisdiction. The concept is most commonly applied on the edge of a fire department's primary response area where travel times may be excessive or where a fire department may not have adequate staffed units or low staffing levels. Automatic aid is currently used only for hazardous materials responses within the County.

Insurance Services Office Rating

Fire Insurance Rating. The Insurance Service Office (Verisk) surveys and rates most cities and towns in the country with regard to the ability of their structure fire defenses to effectively prevent, mitigate and control fire losses. Representatives of ISO conduct onsite assessments of a community's property structure fire risks, including the condition, construction, and occupancy of structures. Concurrently, an assessment is made of the community's structure fire defenses, including the abilities of the fire department, 911 emergency communications, and water system. From this assessment the community is assigned a rating, or classification, on a scale of 1-10, with a Class 1 being optimum protection and Class 10 being no recognized structure fire protection. From this classification an individual property's annual premium is in part established by the company providing insurance coverage. The ISO provides these services to subscribing insurance providers through the company's Public Protection Classification (PPC) program.

It is important to mention that a community's PPC rating is not the sole determining factor in setting local insurance rates. Instead, some insurance providers have in-house proprietary evaluation processes that may not include the community's PPC rating. Related, the PPC rating reflects a brief analysis of direct and indirect structural fire protection components that do not necessarily reflect the actual output performance of the many elements that comprise the community's fire defense system.

It is also important to point out the PPC rating is not a fire department rating, but one that holistically reflects what and how much there is potential to burn in the community. This is coupled with how well not just the fire department but all of the elements of the community's fire defenses are designed to adequately prevent and control structure fires. The ISO Field Representative's survey only assesses how the fire department's organization and resources are designed to cope with the prevention and suppression of structure fires. The community's final classification is not intended to reflect the fire department's effectiveness in providing other fire suppression services, such as wildland and aircraft firefighting, or non-fire related responses such as emergency medical assists or rescues services.

Generally, ISO resurveys communities every five years, with Troy's latest regrading occurring in 2016. The following Table 4.10 provides a brief overview and explanation of credits the fire departments earned during the grading. Note that the TFD implemented a number of changes following receipt of this grade in order to prepare for the next grading with an improved score. Many of these were in the area of better recordkeeping and more documented training. Nonetheless, the 2016 rating clearly shows areas for improvement.

Based on the above final score of 70.40, the city received a Class 3/3X rating. The Class 3 applies to all insured properties that are within five road miles of a responding fire station and within 1,000 feet of a recognized fire hydrant. The Class 3X applies to properties that are within five road miles of a responding fire station, but beyond 1,000 feet of a recognized fire hydrant or other approved water source. Below (Table 4.11) is an overview of each element's relative classification.

Table 4.10: City of Troy 2016 ISO Public Protection Classification Summary

Fire Defense System Element	Credit Available	Credit Earned
911 Emergency Communications and Fire Department Dispatching		
Receiving 911 Calls and Dispatch Technology	3	1.50
Dispatchers: number of and qualifications	4	2.78
Methods of Dispatching Fire Department	3	2.76
	10	7.04
Fire Department Abilities: Fire Prevention and Emergency Response		
Engine Apparatus: specifications, equipment, and testing	6	4.68
Reserve Engine Apparatus: number of, state of readiness, testing, etc.	.50	0.37
Engine Apparatus Pump Capacity	3	3.00
Aerial Ladder Truck Apparatus: specifications, equipment, testing	4	3.57
Reserve Aerial Ladder Trucks: number of, state of readiness, etc.	.50	0.35
Fire Stations: number of, location, apparatus assigned to	10	7.22
Officers and Firefighters: number of and assignment	15	8.57
Officer and Firefighter Training: certification and refresher training	9	3.19
Structure Fire Operating Policies: standard operating procedures	2	2.00
	50	32.95
Water Supply		
System Design: water source capacity, booster pumps, main layout, etc.	30	24.41
Fire Hydrants: specifications and distribution	3	2.94
Hydrant Inspection and Flow Testing	7	2.40
	40	29.75
Fire Prevention and Mitigation (Fire Department)		
Fire Code Enforcement: fire inspections, building plans review, etc.	2.2	0.47
Public Fire Safety Education: formal programs for target audiences	2.2	1.11
Fire Scene Investigation: investigator cert., policies, and procedure	1.1	0.77
	5.50	2.35
Fire Department/Water System Divergence	0.0	-1.69
Total	105.5	70.40

Table 4.11: Troy Fire Defense System Element Relative PPC

Element	Credit Available	Credit Earned	% Earned	Relative Classification
Emergency Communications	10	7.04	70%	3
Fire Department	50	32.95	66%	4
Water Supply	40	29.75	74%	3
Fire Prevention	5.5	2.35	43%	6

As indicated in the above figure, the Troy Fire Department's relative classification is Class 4; one Class less than the city's overall Class 3. Table 4.12 provides a more thorough review of the Department's credit that illustrates detailed points received in the various sub-elements.

Table 4.12: Troy Fire Department 2016 PPC Credit Detail

Sub-Element	Points Available	Points Earned
Engine Companies	6.0	4.68
Reserve Engine Apparatus	0.5	0.37
Engine Pump Capacity	3.0	3.0
Aerial Ladder Truck Companies	4.0	3.67
Reserve Aerial Ladder Truck Apparatus	0.5	0.35
Fire Station and Company Locations (Deployment)	10.0	7.22
Personnel Assigned to Fire Companies	15.0	8.57
Training & Certification	9.0	3.19
- Training Facilities and Use	(35.0))	(0.00)
- Individual Fire Company Training	(25.0)	(11.45)
- Officer Certification & Continuing Education	(12.0)	(8.50)
- New Apparatus Driver/Operator Certification	(5.0)	(5.00)
- Existing Apparatus Driver/Operator Refresher Training	(5.0)	(5.00)
- Department Hazardous Materials Training	(1.0)	(0.00)
- Recruit Certification & Training	(5.0)	(5.00)
- Department-wide Pre-Fire Training	(12.0)	(0.50)
Structure Fire-Related Operational Policies	2.0	2.00
Total Fire Department Credit	50.0	33.05

( ) Sub-credits within Training and Certification

Reviewing the sub-elements, the Department received the least available points under training and personnel assigned to shift duty per the number of engine and ladder truck companies needed. This may have been due to the total number of company officers and firefighters assigned per shift in relation to the number of engine and ladder truck companies needed per ISO's criteria. Another factor that may have been considered was the number of on-duty positions that are assigned to medic units. Under certain conditions, ISO may deduct all or a portion of on-duty staffing assigned to medic units that are unavailable to respond to structure fires for a significant portion of time. The Department received 57 percent of available credit for on-duty personnel assigned to fire companies.

The other significant sub-element that did not fare well was training for structural firefighting operations. The Department received only 35 percent of the total amount of credit available. Specifically, during the 2016 survey, there was no credit given for the existence or use of recognized training facilities.

Related to the Fire Department, but surveyed separately, fire prevention-related credit earned is illustrated in Table 4.13. Of the 5.5 credits available, the Department earned 2.35, or 42 percent of credits available. No credit was given for assigned fire inspectors or public fire safety educators.

Table 4.13: Troy Fire Prevention 2016 PPC Credit Detail

Sub-Element	Points Available	Points Earned
Fire Code Enforcement		
- Code Adoption and Administration	10.0	8.60
- Staffing Level	8.0	0.00
- Staff Certification and Continuing Education	6.0	0.00
- Fire Prevention Programs (Inspection, permitting, etc.)	16.0	0.00
Total for Fire Code Enforcement	40	8.60
Public Fire Safety Education		
Staff Certification & Administration	10	0.00
Education Programs	30	20.10
Total for Public Fire Safety Education	40	20.10
Fire Scene Investigation		
Organization and Staffing	8.0	4.40
Investigator Certification and Training	6.0	3.60
Use of National Fire Incident Reporting System	6.0	6.00
Total for Fire Investigation	20.0	14.00
Total Fire Prevention Credit	2.35	5.50

County Resources

Rensselaer County

County agencies include the Rensselaer County Bureau of Public Safety, most notably the 9-1-1 Emergency Communications Center, the County Fire Coordinator, and office of Emergency Management.

Bureau of Public Safety. The Bureau manages the county-wide emergency communications center, including the 911 emergency services communications system. The bureau is also responsible for emergency management coordination with county government, local municipalities, and state and federal agencies, including the New York State Office of Emergency Management and the Federal Emergency Management Agency. Specific services include:

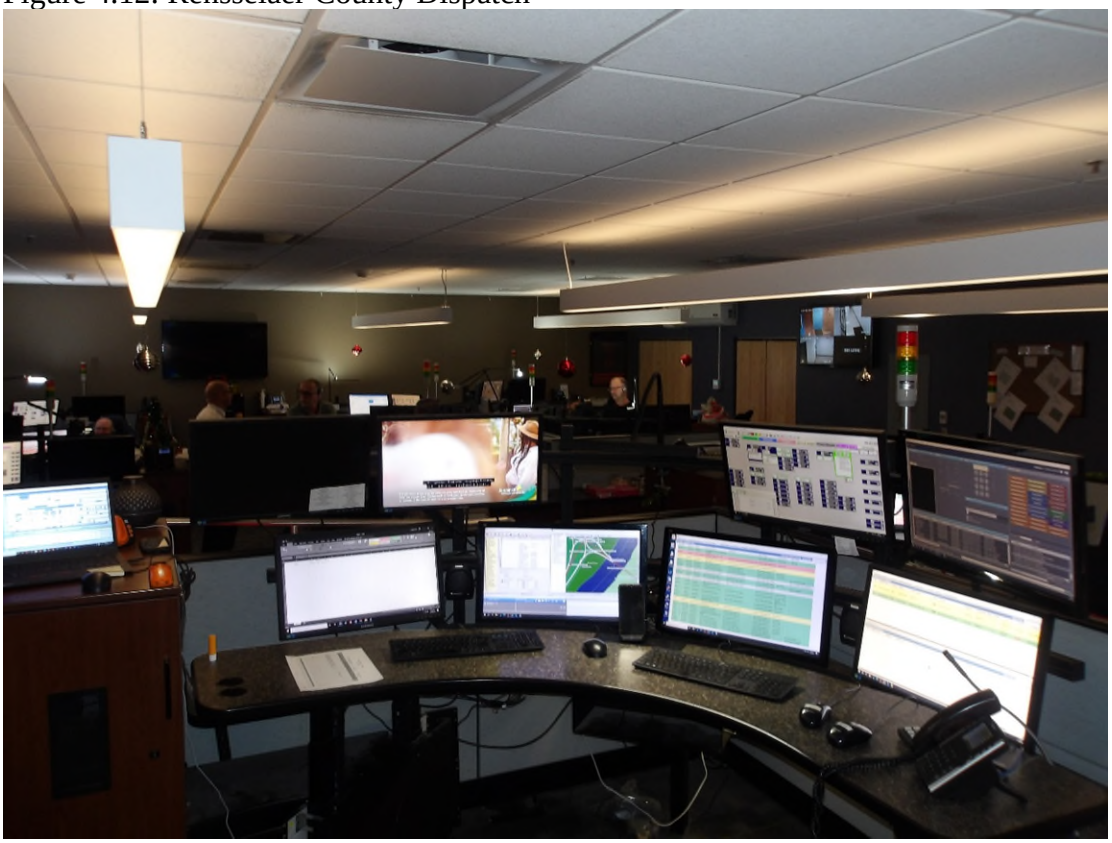
EMS Coordinator. The EMS Coordinator is responsible for administration of the various county programs associated with EMS, such as training, emergency responses, multiple casualty

incident management, and resource stockpiles. The coordinator and staff respond to incidents requiring the response of multiple EMS agencies and provide other support for the local EMS Squads.

Fire Coordinator. Under the direction of the New York State Office of Fire Prevention and Control, the fire coordinator is responsible for administering the county portion of the state-wide mutual aid system. Other responsibilities include the management of much of the county-wide firefighter outreach training program, the county fire training facility located in North Greenbush, and the investigation of fires and related incidents.

Emergency Communications. The Rensselaer County Emergency Communications Center (Figure 4.12) is responsible for answering cellular and land line based non-emergency and 911 emergency telephone calls, as well as the 800mHz emergency radio network. When fully staffed, there are 32 Communications Officers, six Senior Communications Officers, and the Communications Center Supervisor. The center dispatches the county's 41 fire departments, 14 ambulance agencies, and nine police departments, including state, county and local jurisdictions. The city of Troy contributes $1,000,000 annually to the county for 911 dispatching of the Troy fire and police departments.

Figure 4.12: Rensselaer County Dispatch



This arrangement is unique as Troy is the only municipality that pays for service. We understand that the county had assumed this responsibility for the balance of the jurisdictions. However,

when Troy proposed to move to the county, it was determined that its workload was nearly equal to that of the balance of the county, and the $1,000,000 figure was an attempt to capture the added costs of providing this service.

Training Facility. In 2023, the bureau opened a new training complex in nearby Wynantskill (Figure 4.14). The complex includes various displays, exercises, and a state-of-the-art control system. The complex consists of an exterior drill ground equipped with props for various firefighting scenarios, and a combination smoke building and drill tower (Figure 4.13). An education building is provided that features large classroom space and instructional displays. Construction started in 2021 after delays due to the pandemic. The facility cost around $6 million.

Figure 4.13: County's New Training Facility Drill Tower/Burn Building

Figure 4.14: County’s New Training Facility Classroom Building

5. DEMAND FOR SERVICE

The demand for services includes an analysis of the frequency and nature of emergency incidents the Bureau of Fire has responded to over the course of the most recent five-year period. The analysis included all incidents, including all fire, EMS, and other emergencies where the Bureau was dispatched. Further analysis was conducted to determine the Bureau's performance, but was limited due to incomplete or insufficient information and data provided by either the Rensselaer County dispatch center or the Bureau.

Data Sources

There were three main data sources used for analysis of the demand for service. Primary sources of data analyzed included the dispatch data from the Rensselaer County 9-1-1 Center, Troy Fire Department *Red Alert*[6] records management system, and their *emsCharts*[7] electronic patient care reports. This EMS patient care records system is compatible with the National EMS Information System (NEMSIS)[8] .

Rensselaer County 9-1-1 captures key data including the time a 9-1-1call is made, answered, and time of dispatch. They are also responsible for tracking which units are dispatched, and when those units go on scene and return to service. They were unable to produce a request for call processing statistics, and we had generally limited data. However, the TFD's records system interfaces and receives automatic downloads of key data which could be used to assemble most statistics.

Troy Fire has some practices that limit available data as well. The Department has a policy that only the first unit arriving on reported structural fires reports on the radio. This policy is intended to limited radio channel congestion in the initial minutes of a working fire, and is based on some incidents where calls for assistance or other critical traffic were missed by other units coming to the scene.[9]

Unfortunately, this policy means that no response times are recorded for any unit other than the first on the most important incident type. Not having this data makes measuring compliance with national standards or industry practices nearly impossible.

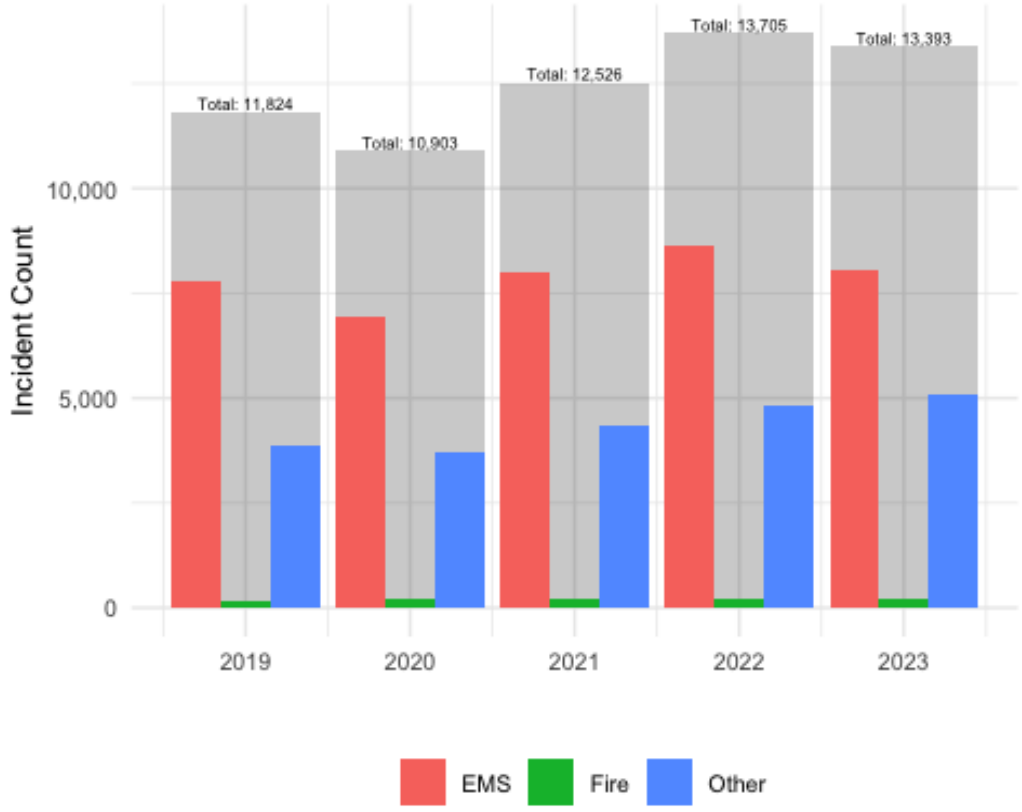
The analysis began with a review of the type and frequency of incident responses based on the broad categories of fires, medical-related emergencies, and other incidents. Figure 5.1 provides an overview of these incidents for the years 2019-2023. The figure indicates a gradual increase

[6] Copyright RedNMX™ from Alpine Software, Fire Department RMS Software
[7] Copyright ZOLL *emsCharts Solution Overview.pdf (zolldata.com)*
[8] Home - NEMSIS
[9] Similarly, many departments routinely switch units operating at a working fire (or reported working fire) onto a separate channel to avoid interference. Human error sometimes results in units or personnel not switching channels and missing critical communications.

over the 5-year period with a slight decline in 2023. Emergency medical-related incidents were, by far, the incident type with the greatest number of incidents, followed by the category of other. The least frequent type of incident was the fire-related category. It is important to note that fire-related incidents being the lowest in frequency does not necessarily correlate to the city not having a high or severe fire problem. Though less frequent, a typical structure fire can require a significant amount of staffing and resources over an extended period of time, often impacting a large number of people, as compared to a high percentage of emergency medical related incidents where one to two units are committed for one hour or less.

Overview of Incidents

Figure 5.1: Incidents by General Type



Incidents by NFIRS Major Type Series. The NFIRS further breaks down emergency incidents into nine subcategory code series that cover the entire spectrum of fire department emergency responses. The purpose of the coding is to identify the various types of incidents the fire department responds to and allows the city to track the full range of incidents that occur within its jurisdiction.

Table 5.1 provides a more detailed view of the nature of emergency responses. As previously mentioned, the vast majority of responses are for medical emergencies, including rescue related

calls such as motor vehicle accidents with entrapment. Following are incidents within the 600 and 700 series, most of which fall into the various categories of false alarms.

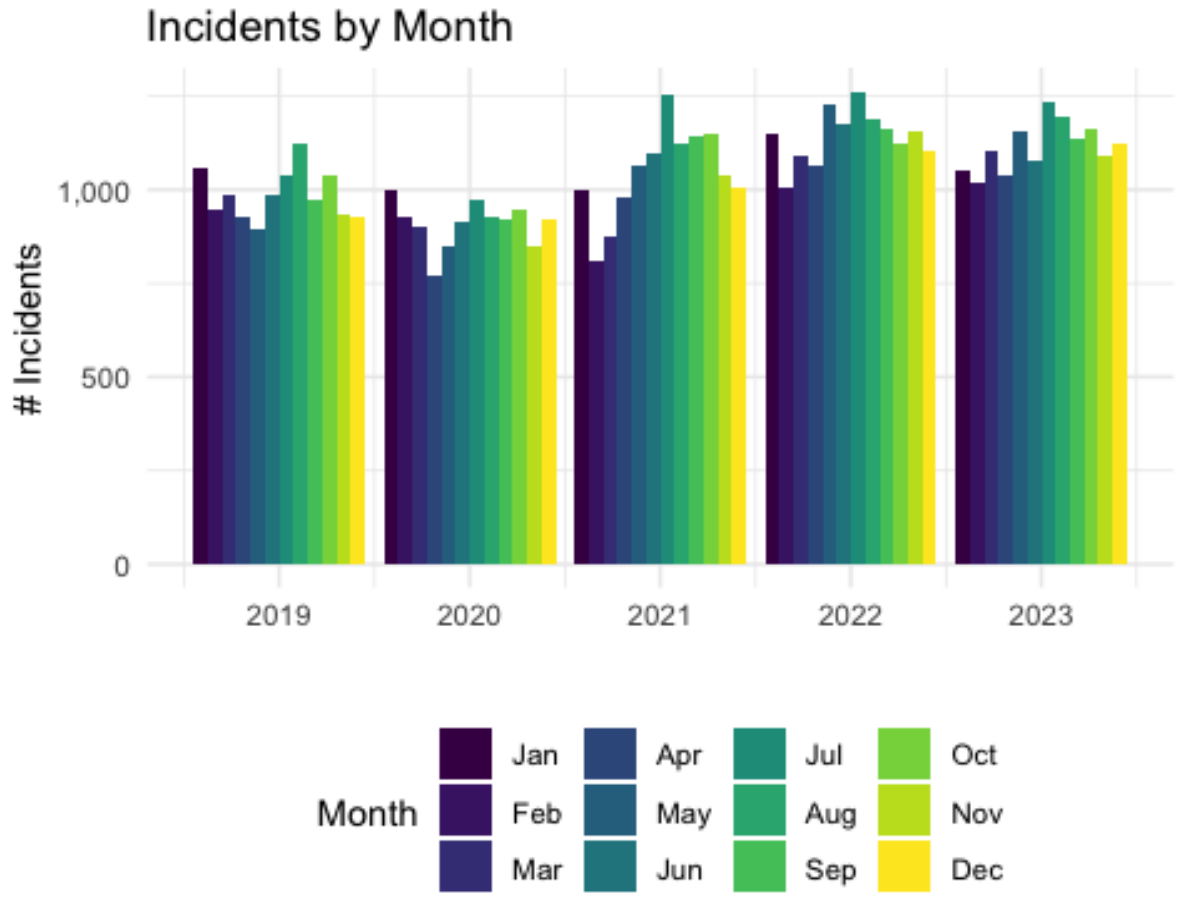
Table 5.1: Major Incident Type Breakdown 2019-2022

Category	2019	2020	2021	2022	2023
Fires					
Building Fires	83	91	82	74	59
Vehicle Fires	20	17	11	27	37
Other Fires	80	134	112	138	146
Total Fires	183	242	205	279	242
Overpressure Ruptures					
Overpressure Fires	18	35	24	24	1
Total Overpressure Ruptures	18	35	24	24	8
Rescue/EMS					
Emergency Medical	7718	6806	7546	8586	7702
All Other Rescue	61	29	30	53	374
Total Rescue	7779	6835	7576	8639	8076
False Calls					
Malicious Calls	24	26	31	49	19
Other False Calls	1728	1501	1625	1814	2015
Total False Calls	1752	1527	1656	1863	2034
Other Calls					
Hazardous Condition	269	228	249	268	351
Service Calls	865	823	1001	1224	1182
Good Intent Calls	912	998	1234	1428	1511
All Other Calls	39	26	10	23	12
Total Other Calls	2085	2075	2494	2943	3056
Total Calls	11817	10714	11955	13708	13416
Civilian Casualty Summary					
Fire Related Injuries	3	4	1	3	2
Non-Fire Related Injuries	1	3			0
Fire Related Deaths			1		
Non-Fire Related Deaths					
Total Civilian Casualties	4	7	2	3	2

Fire Service Casualty Summary					
Fire Related Injuries	1	3		1	5
Non-Fire Related Injuries				1	2
Total Fire Service Injuries	1	3		2	7

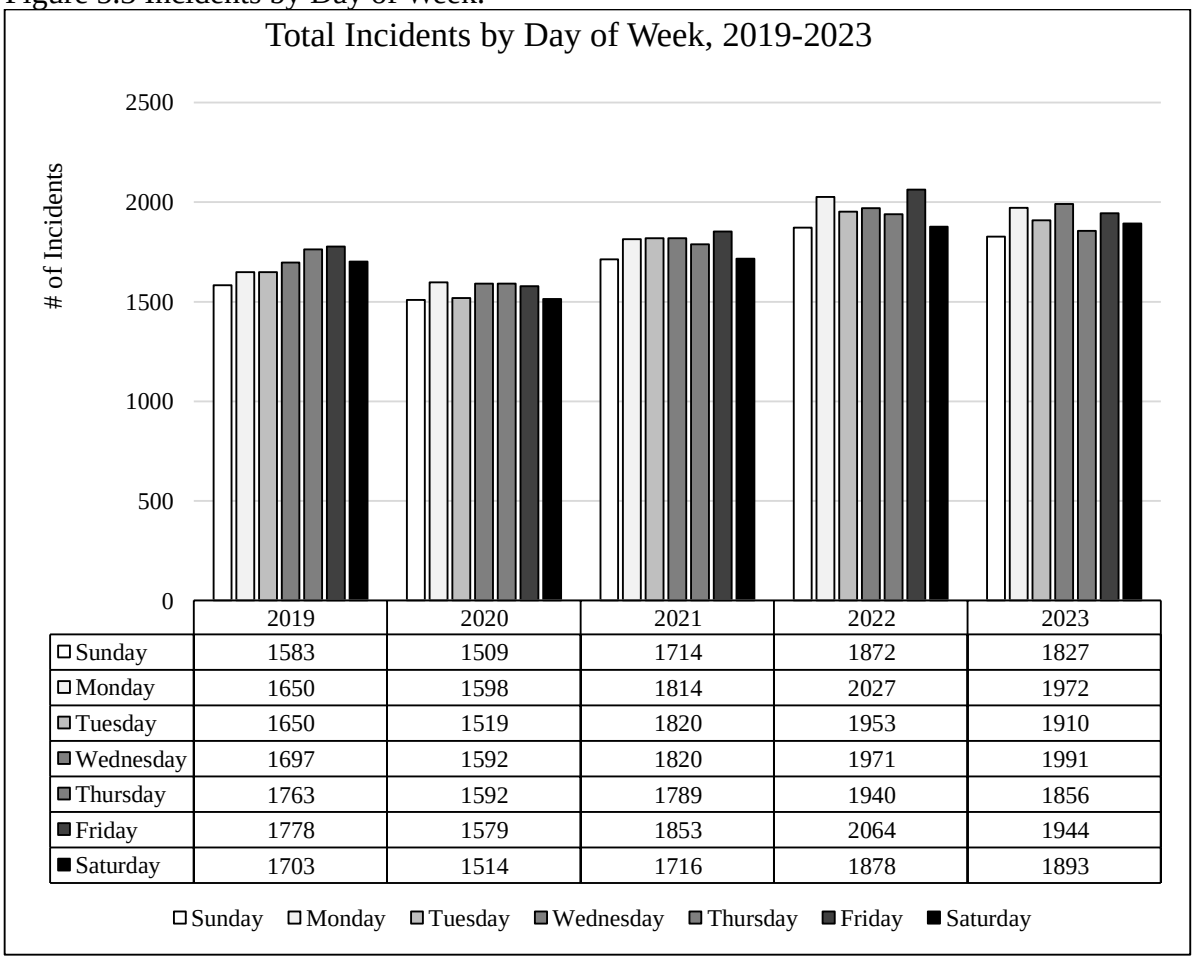
Incidents by Month of Year. Incidents recorded based on the month of the year may indicate trends in emergency responses. The following figure provides an overview of all incidents the fire department responded to, by the month and the year, for the years 2018-2023.

Figure 5.2: Incidents by Month 2019-2023



Incidents by Day of Week. Figure 5.3 provides an overview of incidents by day of week.

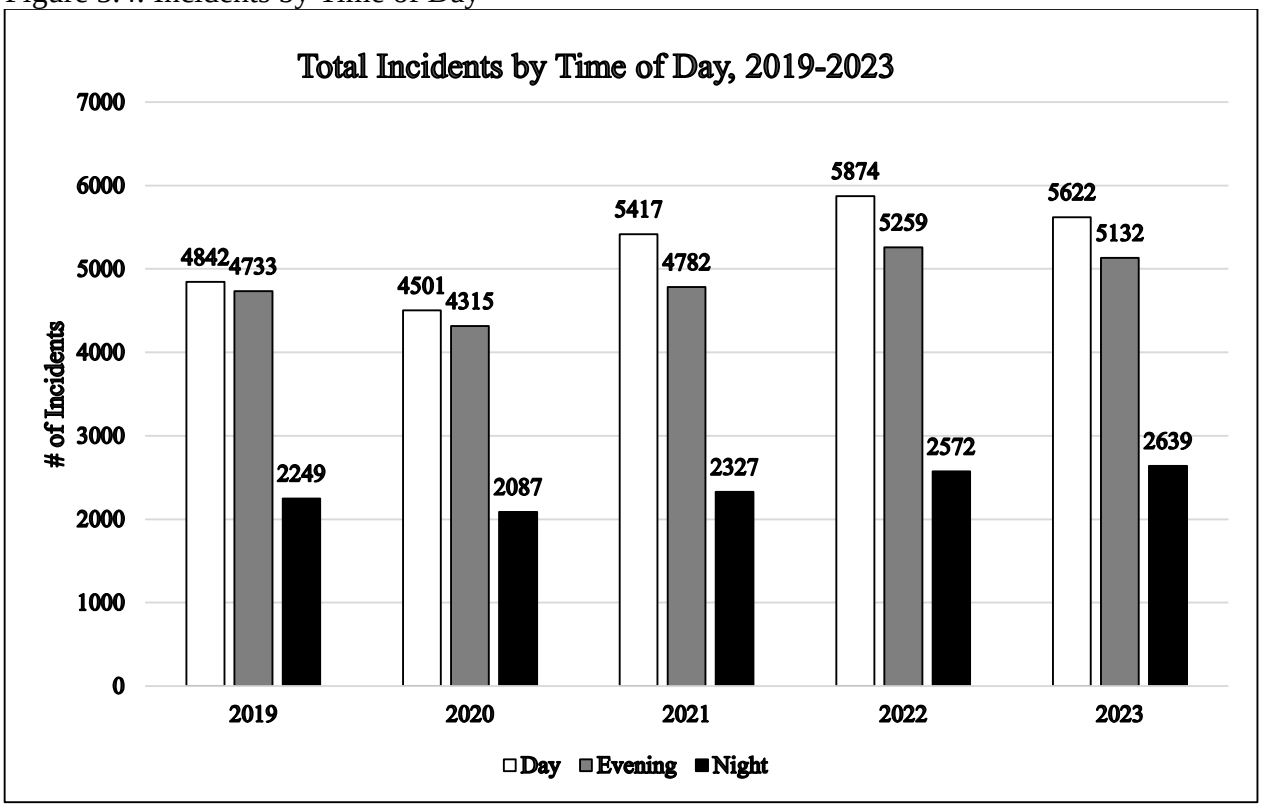
Figure 5.3 Incidents by Day of Week.



	2019	2020	2021	2022	2023
Sunday	1583	1509	1714	1872	1827
Monday	1650	1598	1814	2027	1972
Tuesday	1650	1519	1820	1953	1910
Wednesday	1697	1592	1820	1971	1991
Thursday	1763	1592	1789	1940	1856
Friday	1778	1579	1853	2064	1944
Saturday	1703	1514	1716	1878	1893

Incidents by Time of Day. The majority of incidents occurred during the daytime period which is defined as being between the hours of 8 a.m. and 4 p.m. This followed by the evening, the second busiest period between the hours of 4 p.m. and midnight.

Figure 5.4: Incidents by Time of Day



Note: Daytime is defined as 0800-1600. Evening is defined as 1600-2400. Night is defined as 2400-0800.

Incidents by Property Use. Each incident involving a property is coded for property use. Uses are coded into broad categories such as assembly, educational, or manufacturing. Each use code has multiple sub-codes that better define specific uses in a building or on a property. However, for this analysis only the broad code is analyzed.

Not surprisingly, residential properties account for most of the incidents, with health care facilities coming in second (Table 5.2). These breakdowns are for all incident types, including EMS.

Table 5.2: Incidents by Property Use per NFIRS Type: 2023		
Property Use Code	Description	2023
100-186	Assembly	237
200-256	Educational	258
300-365	Health Care, Detention, and Correction	1,632
400-464	Residential	9,134
500-599	Mercantile, Business	455
600-679	Industrial, Utility, Defense, Agriculture, Mining	18
700	Manufacturing, Processing	23
800-899	Storage	65
900-984	Outside or Special Property	1,552
000	Other Use	7

Fire Incidents

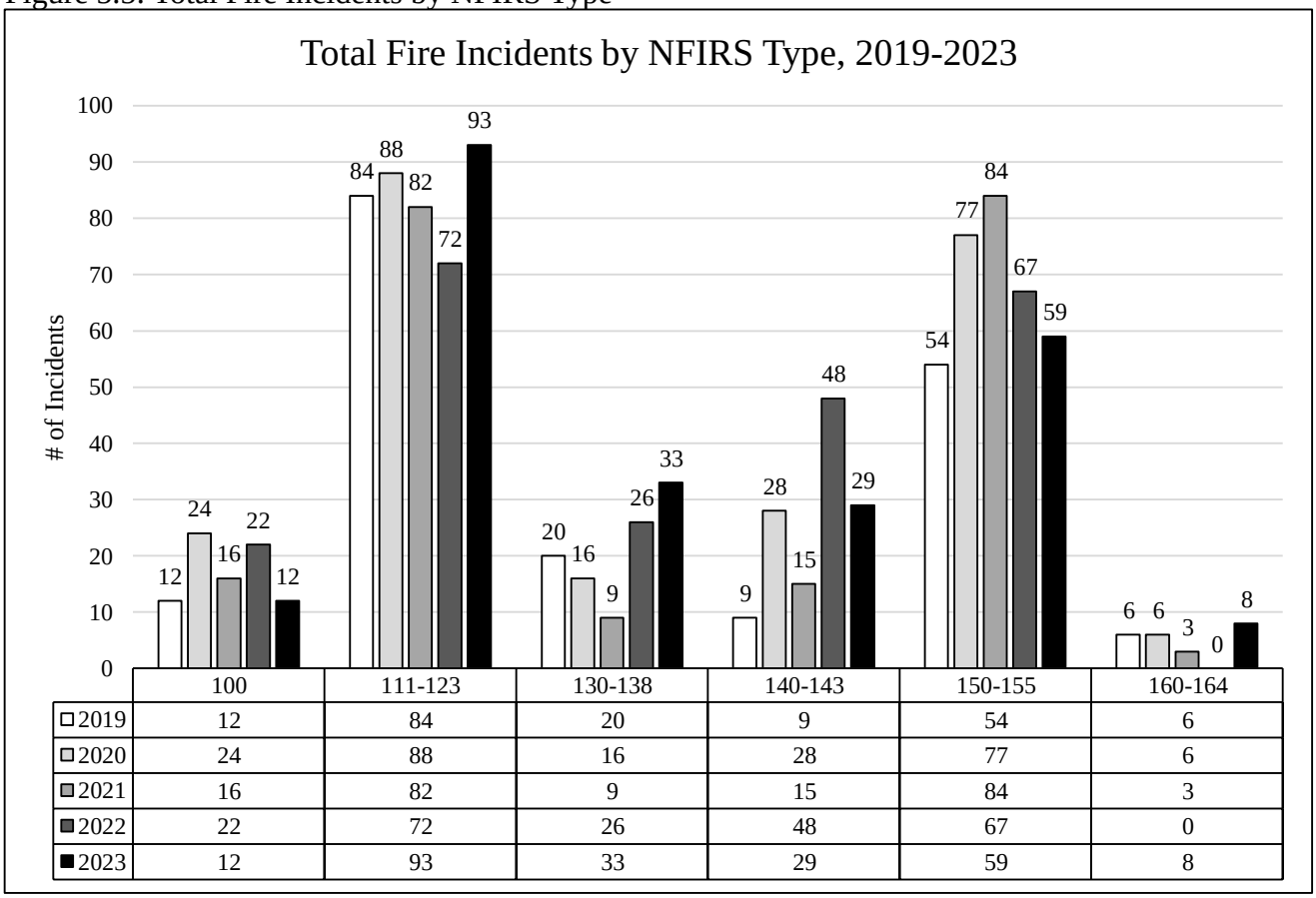
Fire-Related Incidents by NFIRS Type. Fire incidents include those incidents that occur in structures, vehicles, and outside, such as brush and rubbish. The NFIRS includes eight subtypes of fires consisting of the following:

Table 5.3: Fire Related Incidents per NFIRS Fire Type: 2019-2023

Fire Type Code	Description
111-123	Structure related
130-138	Mobile property (passenger cars and trucks, freight trucks, etc.
140-143	Natural vegetation fire (brush, woods, etc.)
150-155	Outside rubbish fire (dumpster, trash, waste, etc.)
160-164	Special outside fire (outside storage or equipment)
170-173	Cultivated vegetation, crop fire
100	Other type of fire

As shown in Figure 5.5, the majority of fire-related incidents involved those that were in the 111-123 range, which are structure fire related. There was an average of 83 structure-related fires annually over the 5-year period. This is a significant number for a city with a population of roughly 50,000, and can be attributed to an older high density building stock as well as socioeconomic factors. The second highest fire incident type was within the range of 150-155, which includes outside fires such as rubbish and trash.

Figure 5.5: Total Fire Incidents by NFIRS Type



	100	111-123	130-138	140-143	150-155	160-164
2019	12	84	20	9	54	6
2020	24	88	16	28	77	6
2021	16	82	9	15	84	3
2022	22	72	26	48	67	0
2023	12	93	33	29	59	8

Fire Incident-Related Casualties. Casualties are defined as a person(s) injured or killed, either as a result of a fire or other emergency incident, or during the mitigation of the incident. Casualties include both civilian and fire department personnel. Other emergency responders such as law enforcement personnel are counted as civilian casualties.

Civilian casualties varied between three and seven.. The only civilian fire fatality was recorded in 2021. Fire service injuries varied from 0 to 5 over the same period.

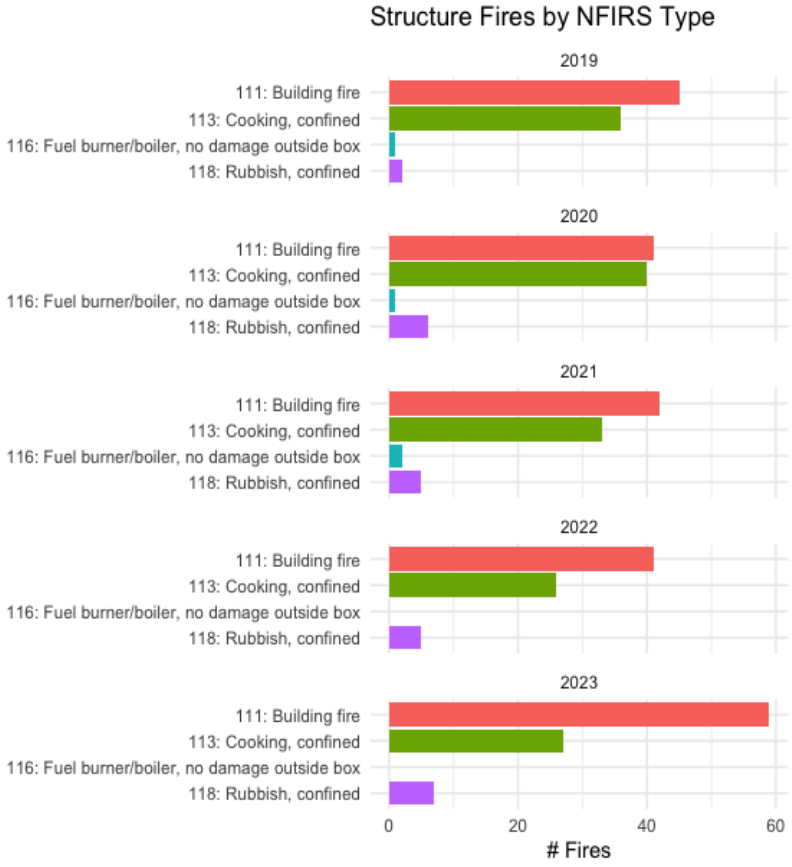
Structure Fire-Related Type Detail: Generally, structure fires include those that directly involve a building's structural components, contents, or its exterior. An important note is the fact that most municipal fire departments were originally organized based on their ability to quickly and effectively control fires involving commercial buildings and dwellings. Fire department organization, the location of fire stations, company staffing, apparatus, and response force capability are all driven by the fire department's ability to reduce structure fire losses. Structure-related fires are coded into the below ten separated subcode types.

Table 5.4: Structure Fire-Related Type Detail: 2019-2023

Structure Fire Type Code	Description
111	Building fire
112	Fire in or on a structure, other than in a building (tunnels, piers, bridges, etc.)
113	Fire in a building, confined to cooking vessel
114	Fire in a building, confined to a chimney or flue
115	Incinerator overload or malfunction, no damage outside incinerator
116	Fuel burner/boiler, delayed ignition or malfunction, no damage outside box
117	Commercial compactor fire, confined to contents of compactor
118	Fire in a building, confined to rubbish, no damage to building or contents
120	Fire in mobile property used as a fixed structure, other
121	Fire in manufactured (mobile) home used as a fixed residence
122	Fire in a motor home, camper, or recreational vehicle used as a structure
123	Fire in a portable building, when used at a fixed location

The majority of these incidents can be classified as Type 111 (Figure 5.5). This includes structure fires where a significant portion of a structure is damaged due to direct exposure to fire.

Figure 5.6: Structure Fires by NFIRS Type



Automatic Alarm Activation-Related Incidents (No Fire). Automatic alarm activity can provide indications of challenges to fire department productivity. Excess automatic alarm is often due to system malfunctions, inferior design, unnecessary or unwanted activation, or acts of malicious behavior. Excessive responses to false alarms can be a drain of fire department resources including the availability of fire and EMS units to confirmed emergencies.

Table 5.5: Structure Fires by Property Use per NFIRS Type: 2019-2023

Alarm system malfunction. Includes improper performance of fire alarm system.	
731	Sprinkler activated due to the failure or malfunction of the sprinkler system. No fire.
732	Extinguishing system activation due to malfunction.
733	Smoke detector activation due to malfunction.
734	Heat detector activation due to malfunction
735	Alarm system activation due to malfunction.
736	Carbon monoxide detector activation due to malfunction.
730	System or detector malfunction, other.

Unintentional system activation (no fire)	
741	Sprinkler activation (no fire), unintentional.
742	Extinguishing system activation.
743	Smoke detector activation (no fire), unintentional.
744	Detector activation (no fire), unintentional.
745	Alarm system activation (no fire), unintentional
746	Carbon monoxide detector activation (no carbon monoxide detected).
740	Unintentional transmission of alarm, other.

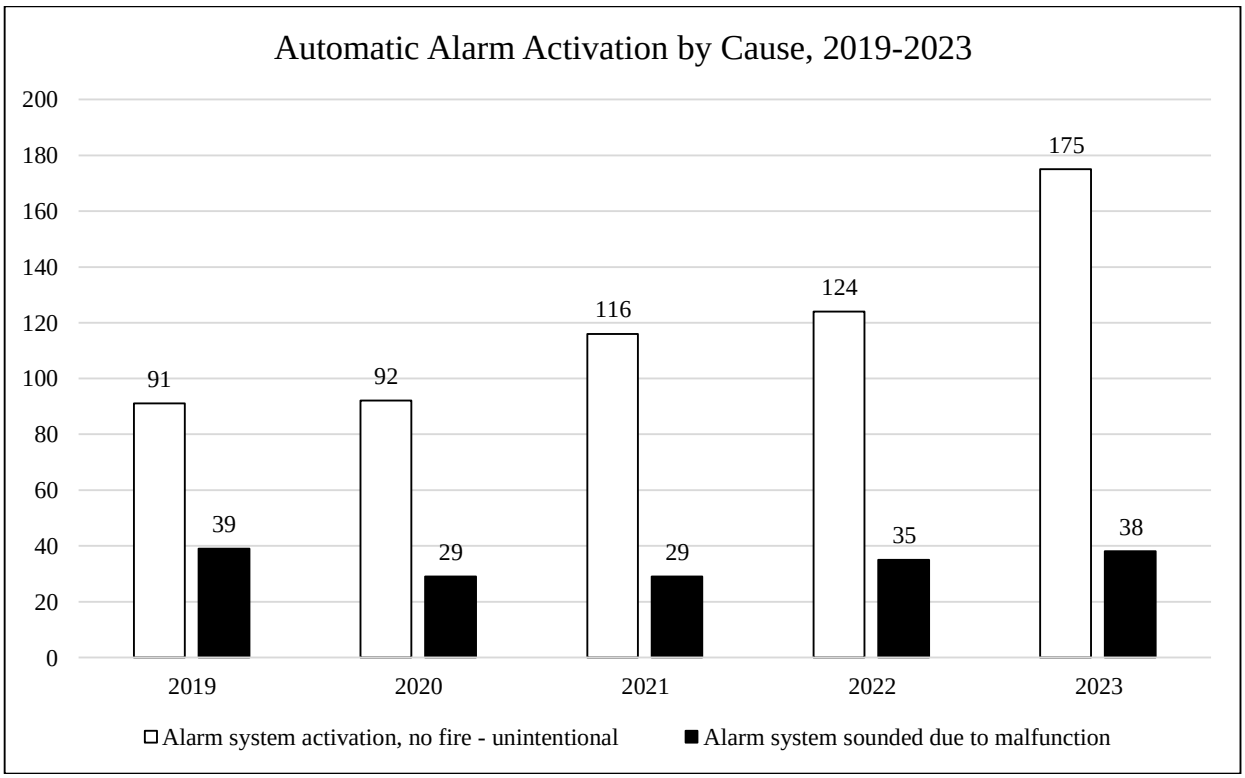
Over the course of the five-year period ending in 2023, there was a total of 738 automatic alarm responses where there was reported no fire or emergency present upon the fire department's arrival. The year 2023 had the highest number of alarms with a total of 113. Figure 5.7 indicates there was an average of 147 alarms per year, or 12 per month. The figure divides the alarms into two major categories: Alarm System Activation, No Fire – Unintentional and Alarm System Sounded Due to Malfunction.

Alarm System Activation, No Fire – Unintentional. There were 598 unintentional alarms averaging 119 per year.

Alarm System Sounded Due to Malfunction. There were 178 alarm malfunctions with an average of 34 per year.

Automatic alarm systems play an important role in today's fire risk management. However, if these systems are not properly designed, installed, and maintained, they create unnecessary use of fire department personnel and equipment. The high frequency of annual automatic alarms where there was no fire adds credence to the TFD's need to have an effective fire risk management program, including effective plan review and annual inspection programs.

Figure 5.7: Automatic Alarm Activations by Cause 2019-2023



Primary Causes of False Alarms

There are numerous causes of false alarms, including poor system design or installation, deterioration, and human error. The below list includes a description of the most common causes of false alarms (from the NFPA Publication: *Fire Service Guide to Reducing Unwanted Fire Alarms*):

- Lack of Maintenance. As with other building systems, fire detection and suppression system must undergo constant review and upkeep, including annual inspections and servicing by qualified representatives of the property owner and licensed alarm and sprinkler companies.
- Working on Fire Alarm or Fire Protection Systems. Individuals working on fire alarm or fire protection systems can also cause unwanted alarms. Individuals working on fire alarms and fire protection systems and components should notify the monitoring company, the AHJ, and the fire department to disregard alarms until notified that testing or work has been completed. In some communities, a permit is required from the AHJ and/or the fire department prior to performing system inspection, testing, and maintenance on fire alarm or fire protection systems. The permit and notification information can be on the permit as a condition of the permit and posted at the fire alarm control panel.

- General Placement. There are certain areas, other than those discussed below, where the installation of smoke detectors/alarms should be avoided. Avoiding these locations will help reduce unwanted alarms.
- Water Flow/Pressure Switches. Water flow/pressure switches can cause unwanted alarms when not set up properly or when changes to the water system have taken place.
- Duct Detectors. Duct detectors are subject to dust and humidity. Maintenance of duct detectors is important to reducing unwanted alarms.
- Manual Fire Alarm Pull Stations. The main cause of manual fire alarm box unwanted alarms is the device being struck in places such as gymnasiums or stocking areas. Other times the location is a prime target for malicious activation.
- Cleaning Solutions. Dust from cleaning and certain cleaning solutions can cause smoke detector activation.

Other causes include:

- Cooking. Cooking is one of the leading causes of unwanted fire alarms. The activation of the smoke detector has many causes: burnt food, unattended cooking, detectors too close or in the same room as cooking operations, cooking taking place in areas where it is not permitted, fans not in operation during cooking, and steam from cooking.
- Smoking. Many states prohibit smoking within or in close proximity to a building. In some cases, smoking is allowed in designated smoking areas in buildings.
- Steam. Steam from showers, cooking equipment, or other appliances can be a cause of unwanted fire alarms.
- Construction. Construction causes many unwanted alarms. Construction dust, hot work, fumes, and other construction work cause alarm activation, and once construction is complete, if the detectors are not cleaned and calibrated, they can cause more alarms.
- Alternate Heating Appliances (Wood Stove/Fireplace/Furnaces). Smoke and heat detectors placed too close to alternate heating appliances can cause unwanted alarms. Improperly maintained heating appliances can cause improper or incomplete combustion, causing alarms.
- Weather Conditions. Detectors and devices can be set off by high humidity, wind, high air movement, and cold and hot temperatures. Heat detectors can be set off by installation exposed to high temperature extremes.

Solutions:

Unnecessary responses by the fire department are a drain on personnel and resources that could be available to respond to medical calls, fires, and other emergencies. False alarms must be managed in a protective way that includes the fire department’s administration, fire prevention staff, and fire companies. A proactive approach to reduce nuisance calls should include the following:

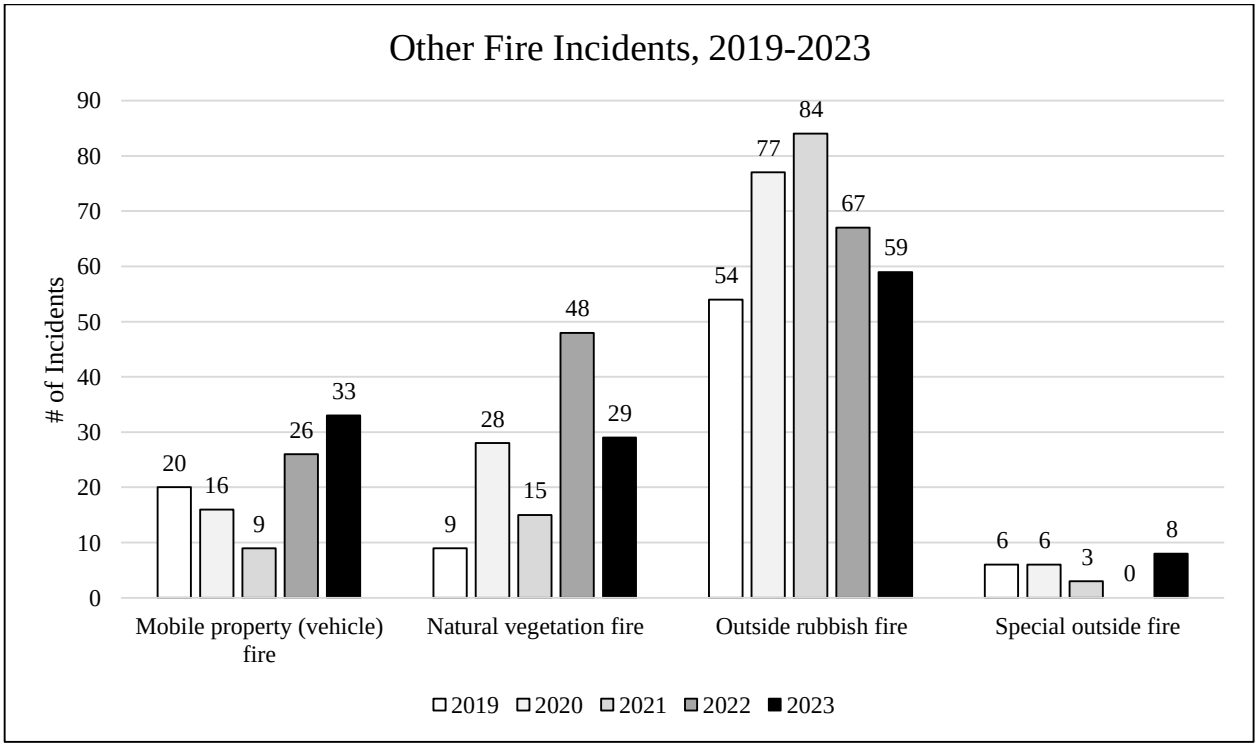
- Full-time staffed Fire Prevention Bureau. In order for the Department to maintain an effective solution to the problem of excessive false alarms, there should be a reestablishment of the Fire Prevention Bureau that is staffed by qualified and competent fire protection specialists. The reduction of false alarms should part of their primary duties.
- Incident Reporting. Ensure fire incident reports are complete and correct in recording false alarm-related responses.
- Property Owners. Determine the causes of false alarms and develop strategies to work in cooperation with property owners and managers that allow for the reduction of unintentional activations.
- Initial Response. Consider modifying Department polices for the initial assignment of fire companies to automatic fire alarm activations. Unless verified by phone, a reduction in the number of fire units responding to automatic alarms may increase the availability of units to other emergencies.
- System Design. As part of the City's plans review process, the Fire Department should take a more active role in the design and installation of manual alarm and automatic detection and suppression systems to ensure their compliance with State and municipally adopted codes and ordinances.
- Public Education. Ongoing public education should be an integral part to the Department's education program, including the proper placement and maintenance of smoke alarms and other early warning systems.

Other Fire-Related Incidents by NFIRS Type.
In addition to structure fires, the fire department responds to a variety of fires that are outside in nature (Table 5.6). These may include passenger or commercial vehicle fires, or those involving brush or open wildland (Figure 5.8). In some communities, other fires may include those related to aviation, including private or commercial aircraft or those that are marine related, such as fires involving pleasure or commercial watercraft.

Table 5.6: Other Fire-Related Incidents by NFIRS Type, 2019-2023

Incident Type Code	Description
130-138	Mobile property (vehicle)
140-143	Natural vegetation
150-155	Outside rubbish
160-164	Special outside

Figure 5.8: Other Fire Incidents 2019-2023



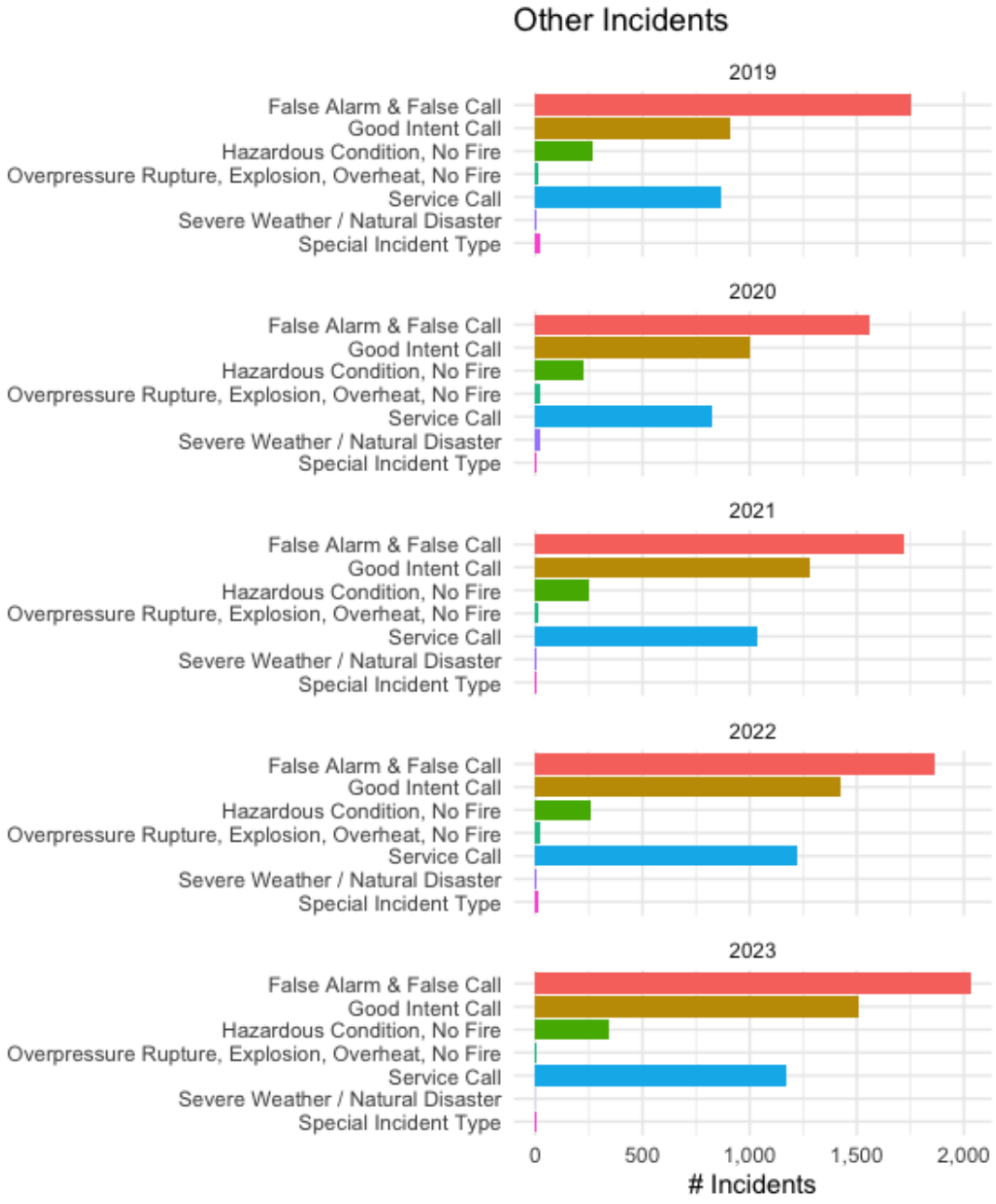
None-Fire or EMS Related Incidents by NFIRS Type. The remainder of the incidents are recorded as those not meeting the criteria of a fire-related or medical incident.

Table 5.7: Other Fire-Related Incidents by NFIRS Type, 2019-2023

Incident Type Code	Description
200-251	Overpressure Rupture, Explosion, Overheat, No Fire
400-480	Hazardous Condition, No Fire
500-571	Service Call
600-672	Good Intent Call
700-740	False Alarm & False Call
800-815	Severe Weather / Natural Disaster
900-911	Special Incident Type

Figure 5.9 indicates the vast majority of incidents for the 5-year period were false alarms in nature, with the second highest in frequency being good intent related.

Figure 5.9: Other Incidents by Type



Fire-Related Dollar Loss Per NFIRS Incident Reports. Collecting property and content loss data illustrates the magnitude of the community's fire problem, provides an additional indicator of the fire severity, and can be used to evaluate a community's progress in reducing its fire losses. In addition to assisting locally, the information can assist in measuring losses at the state and national levels.

Estimated property and content losses are crucial for identifying the types of situations where high monetary losses are common, which then may be used to target specific fire prevention

programs. Loss estimates also can be used to evaluate the cost effectiveness of various equipment and fire protection practices. The importance of recording fire losses is illustrated when such losses are compared with pre-incident values. Comparing these two factors can help define the magnitude of the potential fire problem by providing a basis for comparison.

No data found in incident reporting system.

Fires by Month of Year, Day of Week, Time of Day, and Duration. Tracking incidents based on the month of year, day of week, and time of day can assist in defining trends in fire and emergency incidents.

Figure 5.10: Fires by Day of Week

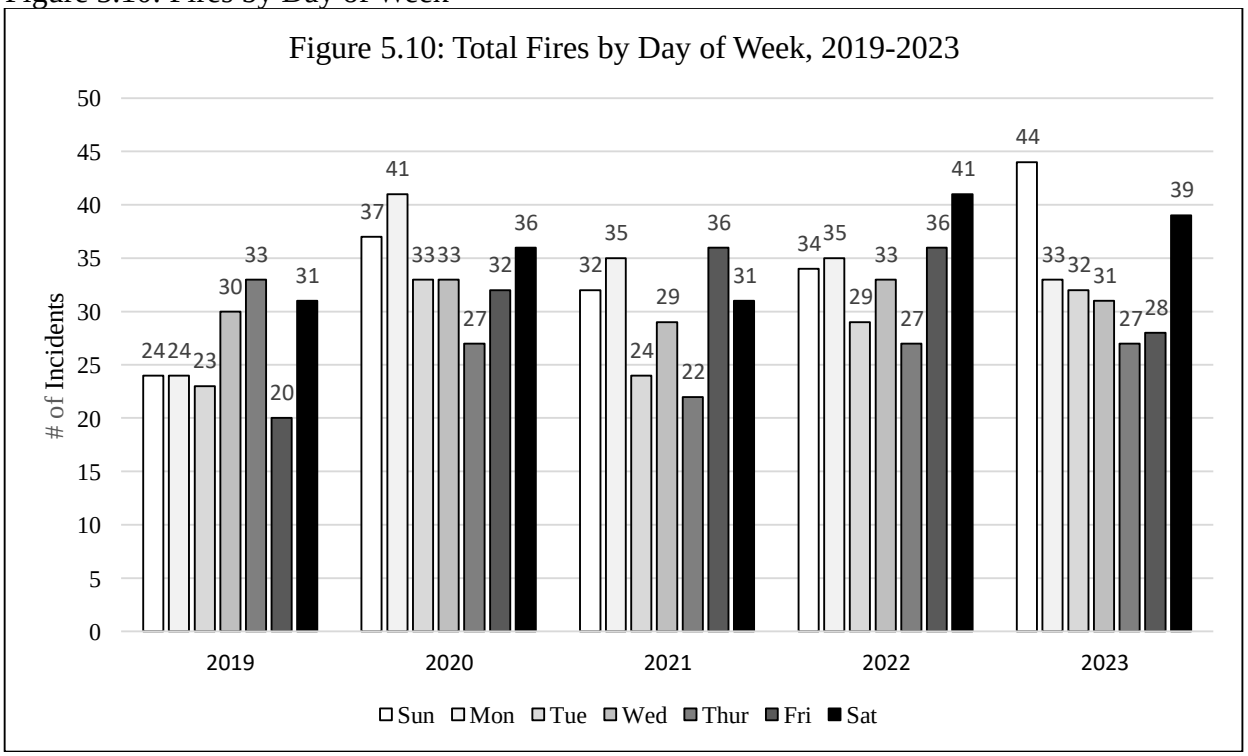
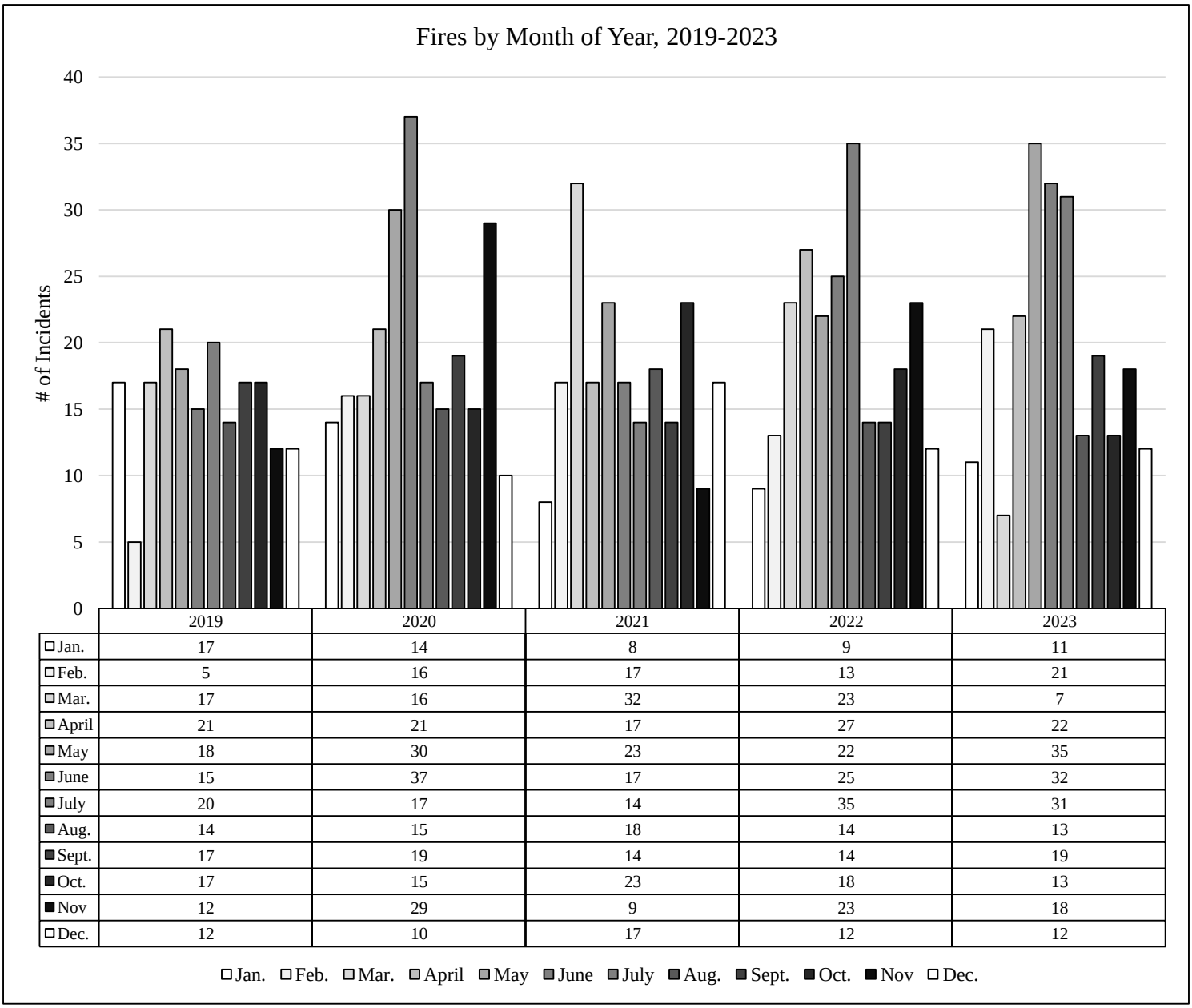


Figure 5.11: Fires by Month 2019-2023



	2019	2020	2021	2022	2023
Jan.	17	14	8	9	11
Feb.	5	16	17	13	21
Mar.	17	16	32	23	7
April	21	21	17	27	22
May	18	30	23	22	35
June	15	37	17	25	32
July	20	17	14	35	31
Aug.	14	15	18	14	13
Sept.	17	19	14	14	19
Oct.	17	15	23	18	13
Nov	12	29	9	23	18
Dec.	12	10	17	12	12

Figure 5.12: Fires by Time of Day

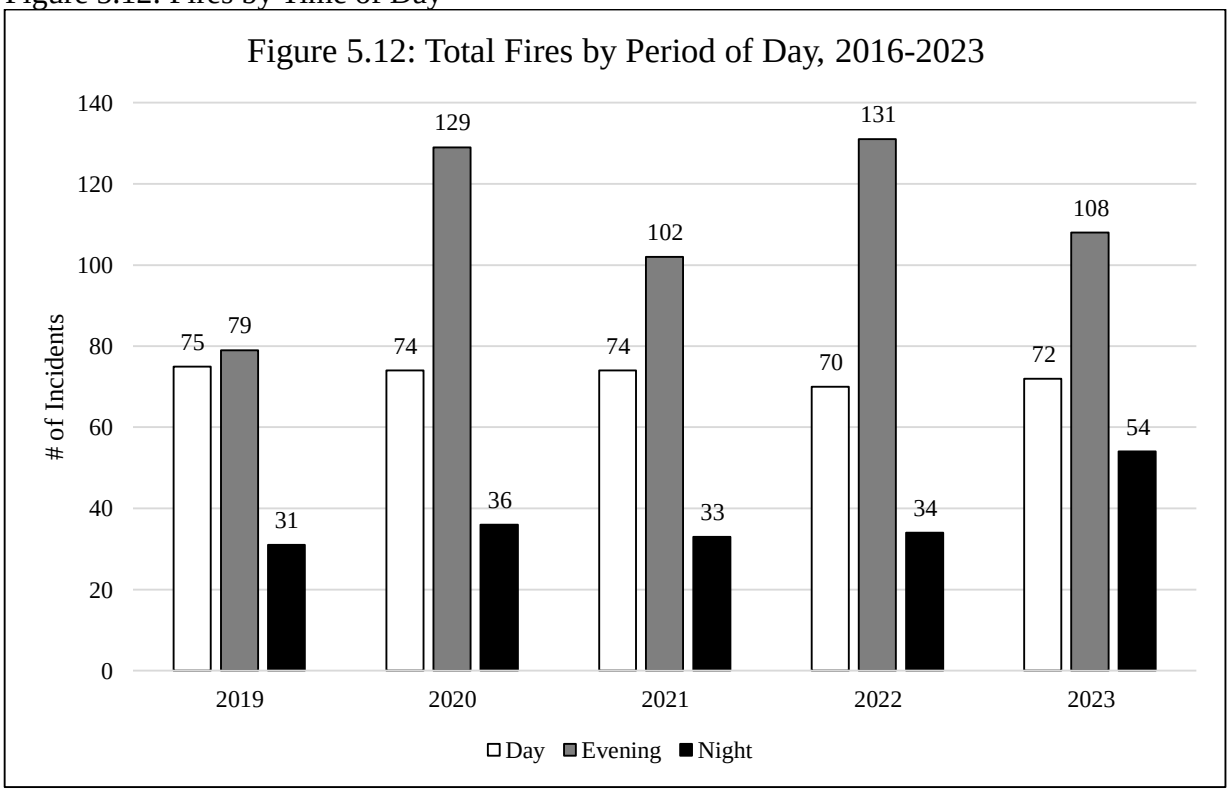
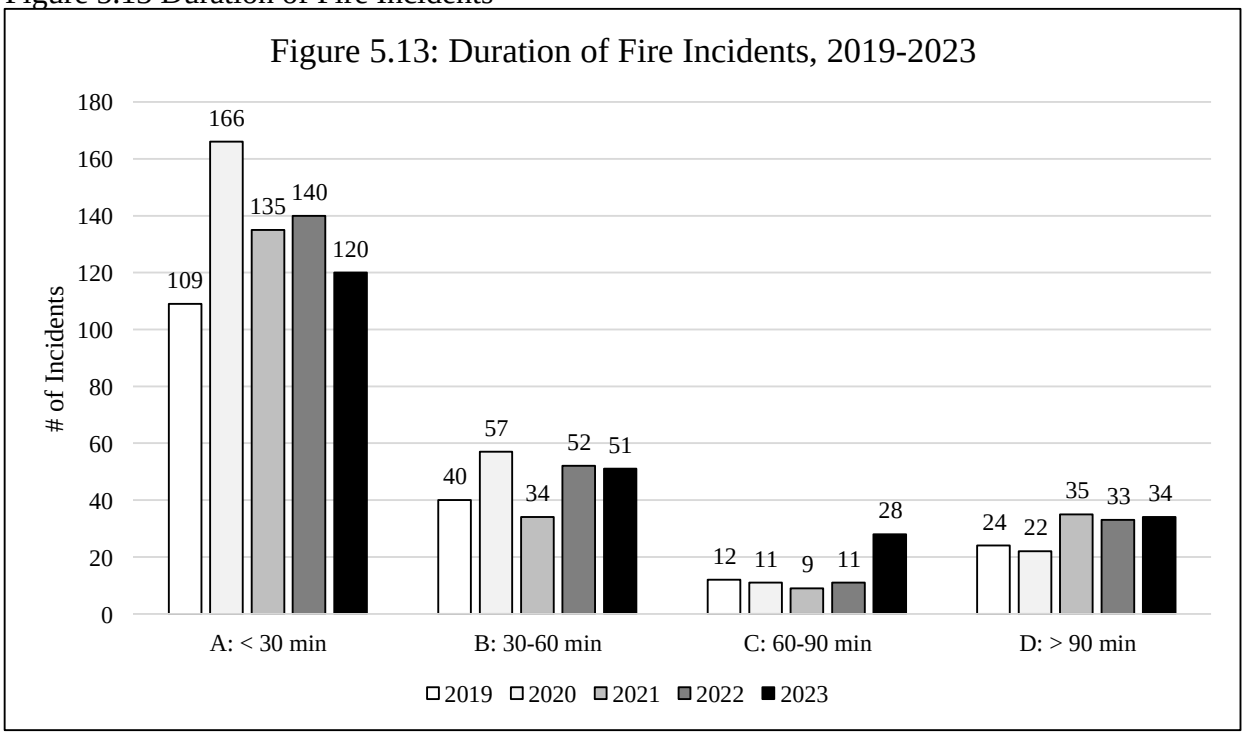


Figure 5.13 Duration of Fire Incidents



EMS Incidents

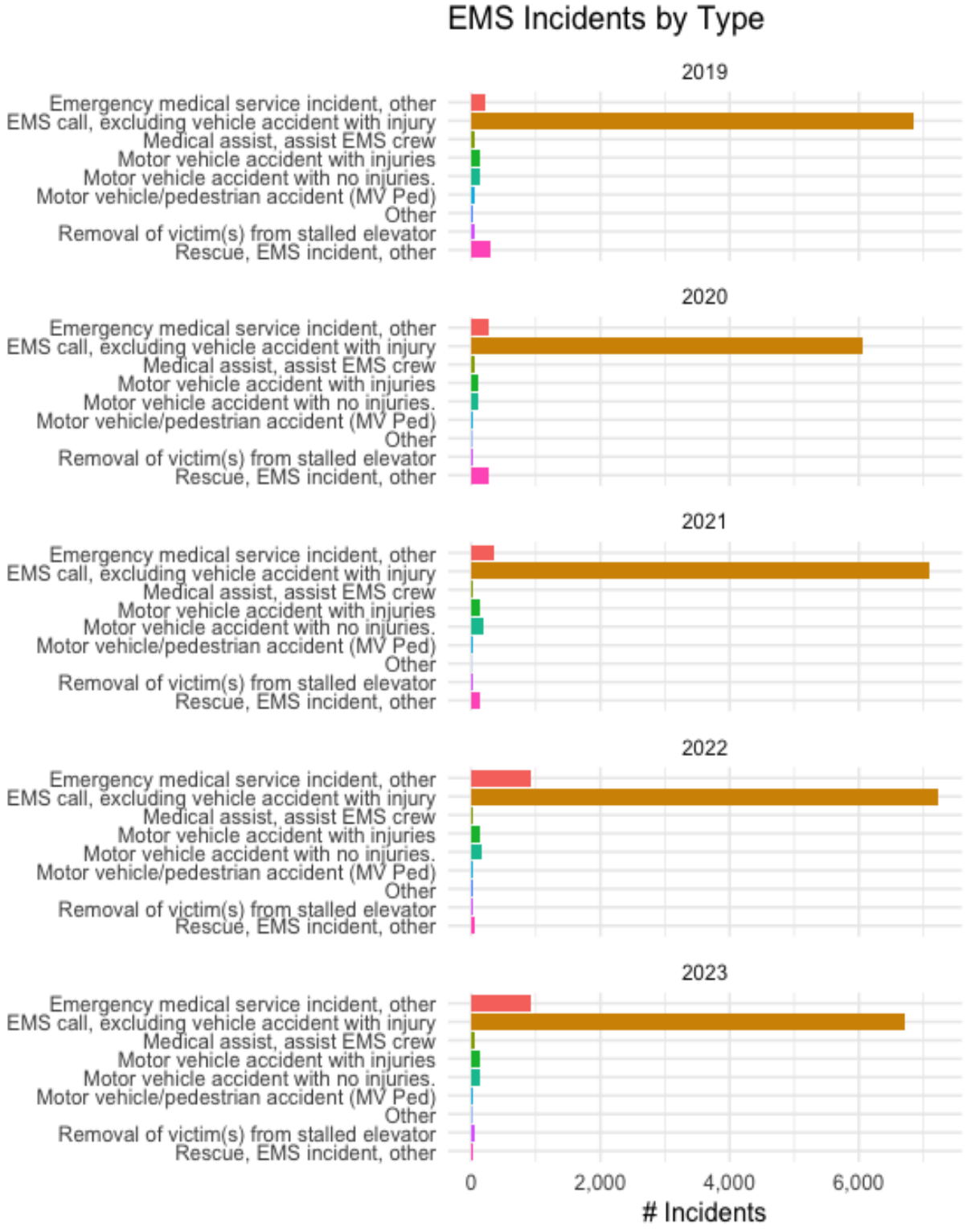
EMS Incidents are captured by both NFIRS and more detailed patient care reports. The NFIRS reports assign EMS-related incidents under a limited number of codes, as shown in Table 5.8. Ambulance incidents are coded as “321,” with other incident types including rescue calls and other incidents that involve a fire unit response.

Total EMS Incidents by NFIRS Type.

Table 5.8: EMS Incidents per NFIRS Type

EMS Type Code	Description
311	Medical assist, assist EMS crew
320	Emergency medical service incident, other
321	EMS call, excluding vehicle accident with injury
322	Motor vehicle accident with injuries
323	Motor vehicle/pedestrian accident (MV Ped)
324	Motor vehicle accident with no injuries.
Other	Other
300	Rescue, EMS incident, other
353	Removal of victim(s) from stalled elevator

Figure 5.14 EMS Incidents by Type (NFIRS)



EMS incidents by initial dispatch.

EMS incidents by initial dispatch are presented in the following table. These data are drawn from the patient care reports. Only categories of incidents with more than 20 occurrences annually are included. A full list of incident types is included in the Appendices.

The first letter preceding each Call Type Code is the priority code. These codes, which range from Alpha to Delta, correspond to the level of severity as ascertained by the dispatcher, who follows a detailed protocol for questioning the caller about the event being reported. The codes are as follows:

(A) Alpha – Non life-threatening – Basic Life Support

(B) Bravo – Possibly life-threatening – Basic Life Support

(C) Charlie – Life-threatening – Advanced Life Support

(D) Delta – Serious life threat – Advanced Life Support

(E) Echo – Life status questionable – Advanced Life Support

(O) Omega – Basic life support, Public Assistance

Table 5.9: EMS Incidents by Dispatch Code (2023)

Category	Alpha	Bravo	Charlie	Delta	Echo	Other
	1966	1704	1637	1737	70	520
	25.8%	22.3%	21.4%	22.8%	0.9%	6.8%

Table 5.10: EMS Incidents by Initial Dispatch 2019-2023

DISPCALLTYPECODE	2019	2020	2021	2022	2023
B-Unknown (Person Down)	597	445	625	823	727
A-Sick Person (Spec Dx)	902	558	808	1076	718
D-Breathing Problems	546	372	515	742	472
MED	138	91	186	343	410
B-Falls	445	297	414	505	355
A-Falls	449	242	338	425	321
C-Sick Person (Spec Dx)	359	248	328	475	316
C-Transfer / Interfacility 37	0	79	270	445	307
D-Chest Pain (Non-Traumatic)	333	152	246	339	255
D-Unconscious / Fainting	272	222	274	329	224
C-Breathing Problems	260	168	242	289	208

DISPCALLTYPECODE	2019	2020	2021	2022	2023
A-Interfacility Transfer	0	26	169	251	195
Alpha EMS	3	1	75	109	157
C-Chest Pain (Non-Traumatic)	157	99	144	203	143
B-Traffic Incidents	144	97	155	178	140
A-Abdominal Pain / Problems	181	111	141	213	135
D-Sick Person (Spec Dx)	73	56	85	140	127
B-Hemorrhage / Lacerations	121	91	118	131	106
C-Overdose (Ingestion)	110	97	115	137	106
C-Abdominal Pain / Problems	85	66	81	108	105
C-Unconscious / Fainting	95	64	90	122	102
C-Stroke / TIA	116	87	79	129	101
B-Assault / Sexual Assault	180	114	110	140	99
D-Unknown (Person Down)	47	42	68	92	93
Bravo EMS	3	2	51	97	90
A-Traumatic Injuries	115	60	94	143	88
D-Traffic Incidents	90	60	66	106	82
D-Hemorrhage / Lacerations	84	72	79	135	77
C-Diabetic Problem	78	66	81	99	72
D-Falls	71	38	64	74	72
D-Overdose (Ingestion)	46	37	53	71	65
E-Cardiac or Resp Arrest/Death	79	69	73	71	62
A-Back Pain Non-Traumatic	66	49	68	77	59
A-Unconscious / Fainting	72	35	53	73	53
Delta EMS	0	3	35	38	52
EMS Transport/Walk-in	19	19	39	59	52
D-Heart Problems / A.I.C.D.	46	40	42	64	51
B-Traumatic Injuries	60	37	45	64	42
A-Hemorrhage / Lacerations	65	45	47	60	40
C-Heart Problems / A.I.C.D.	68	37	54	44	40
EMS Public Assist	18	14	36	56	40
A-Diabetic Problem	63	35	74	50	39
Charlie EMS	0	2	29	48	36
B-Sick Person (Spec Dx)	35	23	36	50	34
D-Stab / Gunshot / Trauma	21	34	22	38	33
C-Headache	47	19	32	46	30

DISPCALLTYPECODE	2019	2020	2021	2022	2023
A-Assault / Sexual Assault	32	16	23	18	26
D-Assault / Sexual Assault	12	8	16	32	26
C-Back Pain Non-Traumatic	28	23	29	34	25
B-Cardiac or Resp Arrest/Death	24	21	21	40	24
D-Pregnancy / Childbirth	45	21	20	39	22

EMS Transports. The frequency of patient transports when compared to the total number of medical-related responses can be used to determine the severity and demand on the EMS system. Table 5.11 indicates there was a total of 18,474 transports for the three-year period of 2021 through 2023. In an additional 1,209 incidents, there was no report on whether the patient was transported to a hospital. Eighty-five percent of patients were transported to Samaritan Hospital in Troy.

Table 5.11: Annual Patient Transports by Facility, 2016-2023

			2020		2021		2022			
Facility	City	Distance	Total	Percent	Total	Percent	Total	Percent	Total	Average
Samaritan Hospital	Troy	.5	4,927	80.4	5,897	82.4	6,441	85.0	17,265	5,755
Albany Medical Center Hospital	Albany	11.0	388	6.3	366	5.1	307	4.0	1,061	353
St. Peters Hospital	Albany	14.0	158	2.6	201	2.8	149	2.0	508	169
Albany Med Massry Childrens Center	Albany	11.0	75	1.2	118	1.6	141	1.9	334	111
Veterans Administration Medical Center - Albany	Albany	11.0	38	0.6	63	0.9	71	0.9	172	57
Samaritan Hospital at Albany Memorial Campus	Albany	12.0	46	0.8	86	1.2	49	0.6	181	60
Burdett Care Center	Troy	.5	33	0.5	63	0.9	41	0.5	137	45
Ellis Hospital	Schenectady	15.0	5	0.1	5	0.1	7	0.1	17	5.6
Albany Memorial Hospital	Albany	8.3			4	0.1	2	0.0	6	3
Bellevue Woman's Hospital	Niskayuna	12.5	1	0.0	0	0.0	0	0.0	1	1
St. Mary's Hospital - Seton Health	Troy	.5	1	0.0	0	0.0	0	0.0	1	1
Not Entered	—	—	453	7.4	383	5.4	373	4.9	1,209	403

Simultaneous Incidents

The TFD's internal software program produces reports on the number of overlapping incidents. These reports are based on the number of incidents occurring with some degree of time overlap (at least one unit is committed to an incident when another incident occurs) or incidents within a short time interval. Using criteria defined by the software, we obtained the following data on overlapping or near-overlapping incidents.

Table 5.12: Overlapping Incidents 2019-2023 (RedNMX Criteria)

	2019	2020	2021	2022	2023
Number of Incidents	9271	8277	9939	11208	10959
Total Receiving Aid	19	16	46	31	32

With the exception of 2019-2020, the number of overlapping incidents has increased. This increase is a function of both increasing numbers of incidents and the higher utilization of units, meaning that they are unavailable for longer periods of time during the day. This is notable especially given that Rescue 3 was placed into service as a peak-hour Medic unit during 2021.

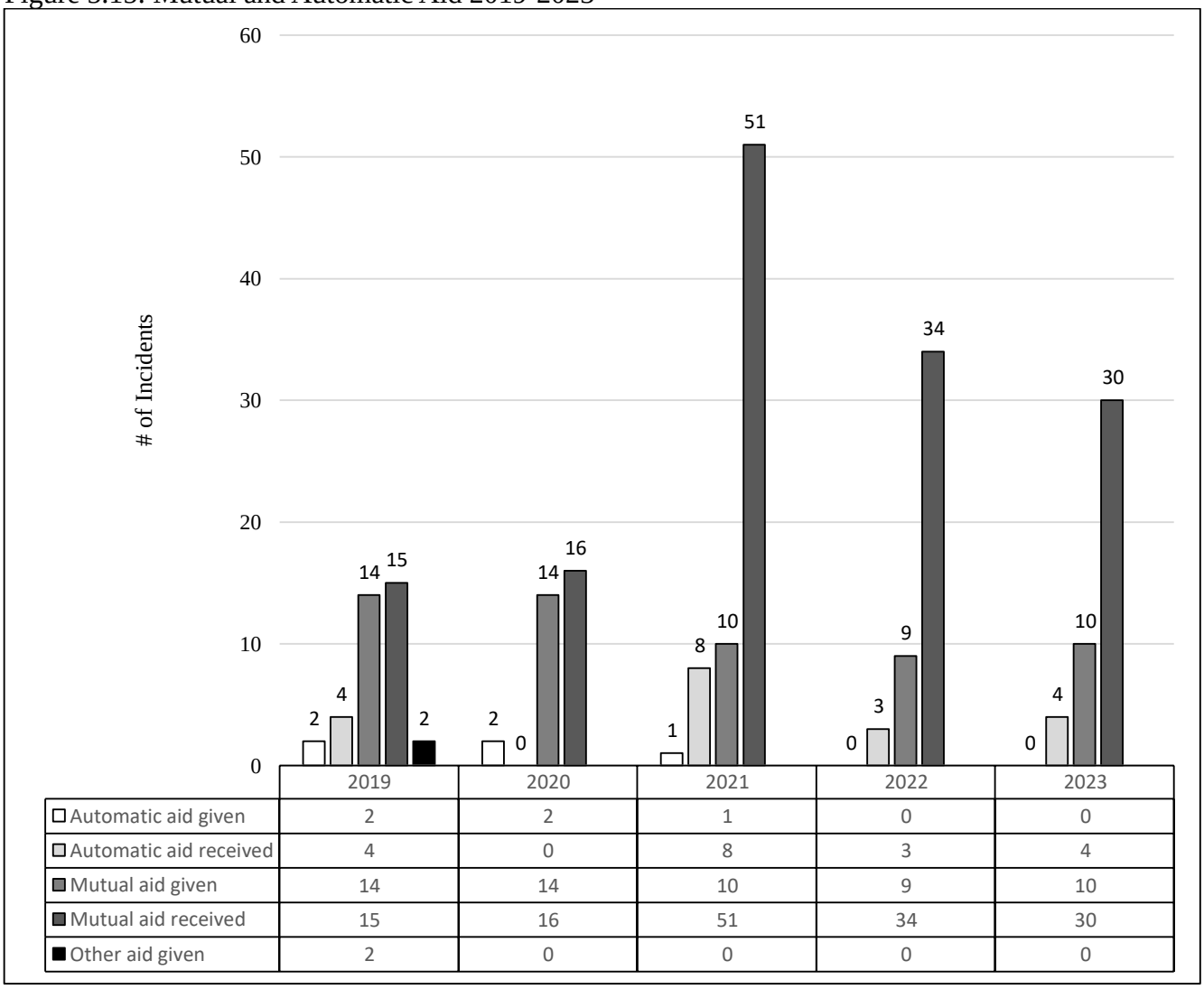
5.6. Automatic and Mutual Aid.

It is beneficial for the city to identify the amount of aid that is received and given from allied emergency services, particularly those fire and EMS agencies that border the city. This information can be used to study response levels necessary to control various fire and emergency situations. It can be used to determine the adequacy of resources at the local level and the need for adjusting cooperative agreements. There are two primary types of aid provided as defined below:

Mutual Aid is the result of a request from one agency to another, based on the circumstances of a particular incident. Automatic aid is a predefined request that both agencies agree to in advance, and can be implemented without need for approval.

Figure 5.15 below provides a brief overview of the Department's mutual and aid experience over the most recent five years.

Figure 5.15: Mutual and Automatic Aid 2019-2023



	2019	2020	2021	2022	2023
Automatic aid given	2	2	1	0	0
Automatic aid received	4	0	8	3	4
Mutual aid given	14	14	10	9	10
Mutual aid received	15	16	51	34	30
Other aid given	2	0	0	0	0

The next chapter discusses how these incidents impact the actual responses and workloads of units within the Troy Fire Department.

6. DEPLOYMENT ANALYSIS

The location of fire stations and the personnel and resources housed there play a critical role in the Fire Department's ability to provide quality service to the community. Ideally, the number and location of fire stations should be strategically located based on sound performance-based objectives. These objectives should include: the community's accepted type of service, e.g., volunteer, combination, or career; and some form of response expectation, such as arriving before flashover occurs or meeting a specified timeframe for emergency medical patients requiring ALS-level care. There are several nationally recognized deployment models for fire protection and emergency medical services. Though nationally recognized by the fire and EMS industry, many communities have either chosen to reference these guidelines, but with modifications, or have developed their own guidelines based on local needs and abilities. The following section provides an overview of the various recognized deployment models, followed by an application of them to the TFD.

National and Industry Deployment Standards

Fire Protection Benchmarks. Historically, most municipal fire departments are designed around the need to rapidly respond to fires within the built environment. Almost as soon as the first municipal fire department was created, it became clear that an efficient force of firefighters and equipment must be mustered and organized to effectively control fires before lives were lost and property destroyed.

Over many years, research and experience began to identify fire behaviors in homes, factories, and the wide range of other structures commonly found in most cities and towns. An understanding began to be developed that identified fire's behavior during the early and latter stages of its development, the effects of this development on human survivability, and the destruction of the structure and its contents. As part of this research, fire protection administrators have developed fire department response benchmarks that can increase the likelihood of an occupant surviving a fire while minimizing property loss. The following provides an overview of fire behavior and how fire departments should be measured with regard to controlling losses within their community.

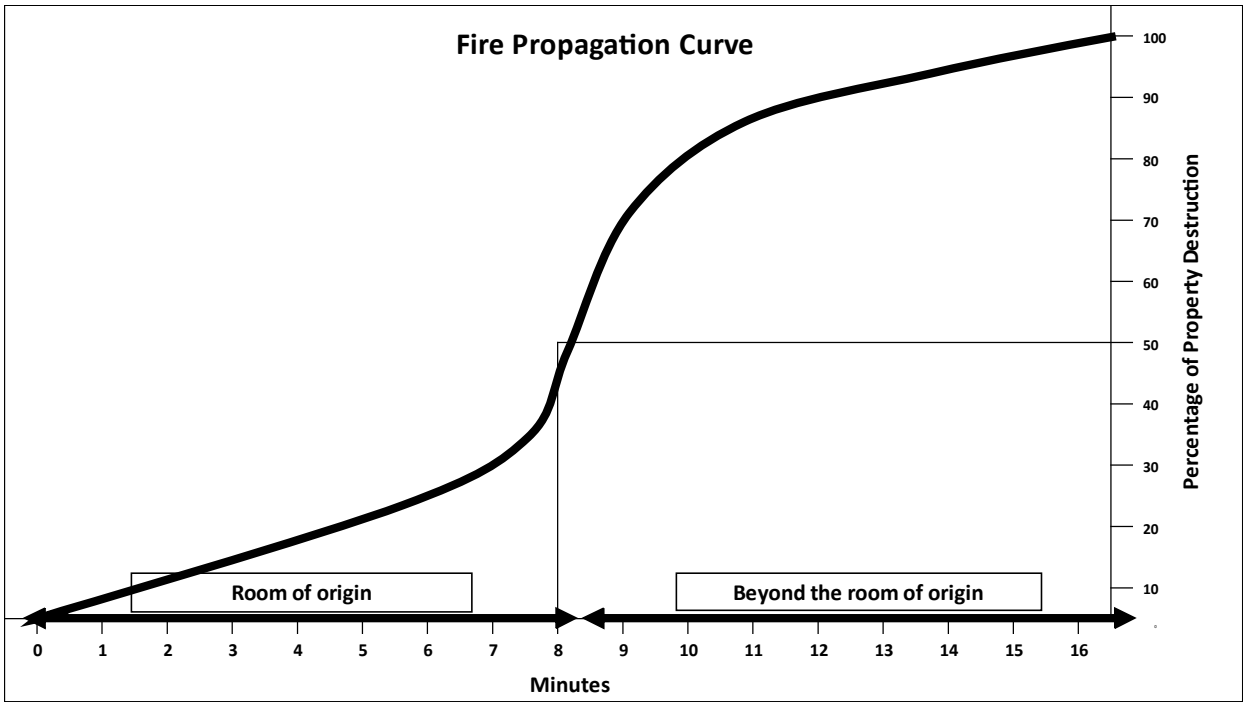
Fire Behavior. There are many factors that come into play to reduce the potential of life and property loss due to fires within buildings, including homes, commercial establishments, and industrial complexes. A fire's behavior within the built environment, the effects of time and temperature, and the level and type of suppression forces at play, all contribute to control of fire in the built environment.

Structure Fire Propagation Curve. Most fires in or on buildings begin small in nature and, if unchecked, will progress to the point of causing significant if not total destruction of a home or business. In Figure 6.1, the line representing the fire propagation curve, which combines temperature rise and time, denotes a rate of fire propagation in an un-sprinklered room and

roughly corresponds to the percentage of property destruction. At approximately four to eight minutes into the fire sequence, the hypothetical room of origin flashes over. Extension outside the room begins at that point.
The goal of the fire department is to arrive prior to the point of flashover. The amount of time it takes for the fire to be detected, the length of time before someone calls 911, and the time it takes for fire units to be dispatched and travel to the scene, all play a major role in control of the fire before flashover, which is the moment that occupants in the room of origin or nearby will not survive.

To further illustrate a fire's propagation, we can review the next figure. As can be seen in Figure 6.1, in a single-family home the fire progresses to the point of flashover while the fire department is notified and responds. Early warning by means of a smoke alarm alerts the occupants of the fire and thus increases their chances of survival. On arrival, firefighters begin to reduce the fire's severity through manual fire suppression, confining it to the structure of origin while reducing the likelihood of flames extending to neighboring homes.

Figure 6.1: Structure Fire Propagation Curve



An early, aggressive, and offensive primary interior attack on a working fire, where feasible, is usually the most effective strategy to reduce loss of lives and property damage. It becomes apparent that the number of fire stations and the strategic location of firefighters and equipment become critical players in reducing fire losses.

In contrast, Figures 6.2 and 6.3 illustrate the value of fire sprinklers systems. As can be seen, the fire is mitigated well before the arrival of the fire department, increasing the occupant's

survivability while reducing damage to the structure and contents by the byproducts of fire and water damage from firefighting activities.

Figure 6.2: Fire Propagation Within a Single-Family Dwelling – Without Fire Sprinklers

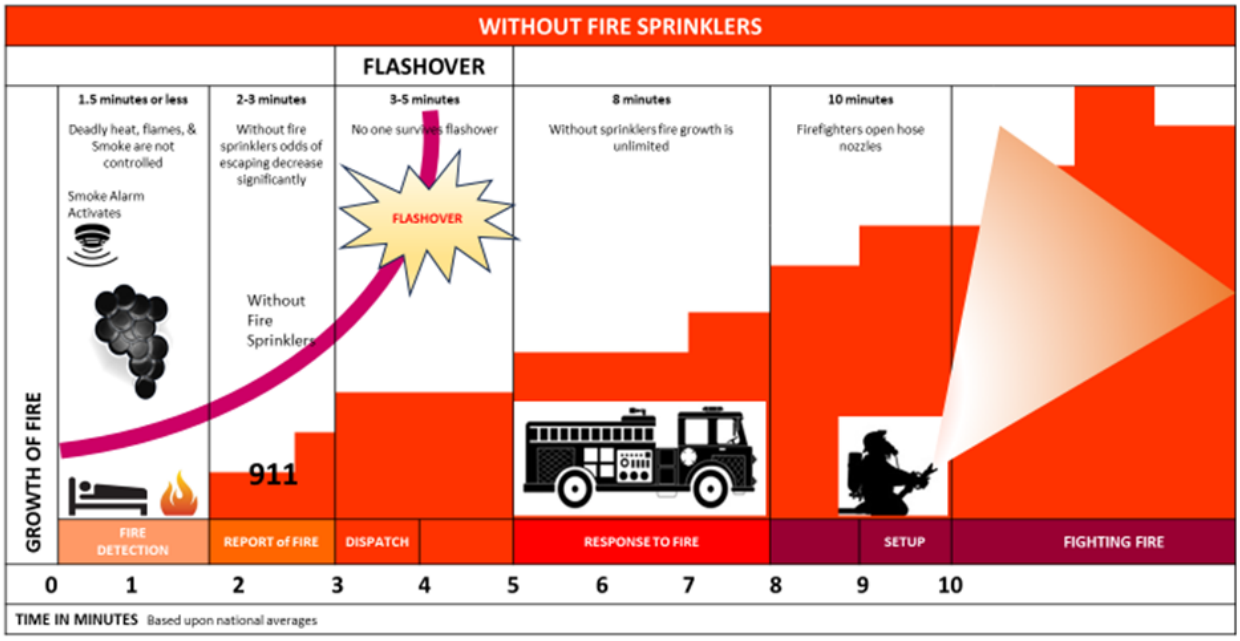
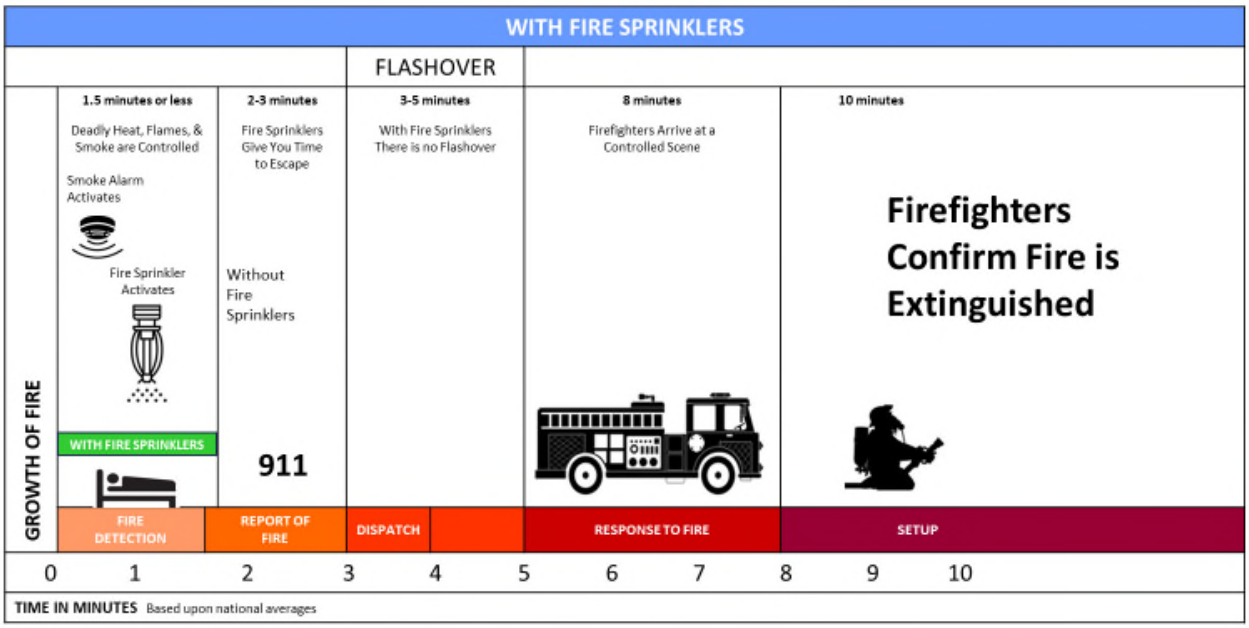


Figure 6.3: Fire Propagation Within a Single-Family Dwelling – With Fire Sprinklers



Fire Department Response Force. The fire department should have in place a sufficient number of resources commensurate to the severity of fire risk in the community they serve. The number of fire stations and their assigned personnel and equipment play a critical role in developing an effective response force. In larger communities, with paid firefighters, a sufficient number of resources may be in a state of readiness in the event of the outbreak of a fire or other emergency. On the other hand, smaller communities often must rely on the local citizenry to dedicate and give their time to serve as volunteer firefighters.

Regardless, a fire will not know the difference between a paid or career firefighter. Fire departments, paid or career, must be able to muster a sufficient number of officers and firefighters to safely remove any trapped or unconscious occupants while simultaneously extinguishing the fire and reducing property loss.

A scenario that is generally accepted by many in the fire protection field is the containment of a fire within a single-family dwelling. The scenario identifies the number of officers and firefighters to contain a fire within a 2,000 square foot frame dwelling of two stories in height and with no basement or immediate exposures. Figure 6.4 better illustrates the scenario.

Figure 6.4: NFPA Single-Family Dwelling Scenario

Staffing Needed. Multiple functions on the fire ground must be carried out simultaneously. Primarily, this includes rescuing any trapped occupants and securing and getting water on the fire. At the same time, support functions must be carried out in order to expedite and safely carry out the operation. As can be seen in Table 6.1, a total of 15 firefighters must be available to respond immediately to a reported structure fire. The table illustrates the many functions that must be carried out concurrently. These functions include personnel operating engines and ladder

trucks, hose crews, rescue and ventilation teams, and a rapid intervention rescue team on standby in the event of a lost or injured firefighter.

Table 6.1: Minimum Staffing for Single-Family Structure Fire

Function	Staffing	
Incident Commander	1	
Pump Operator	2	
Primary Fire Attack Line	2	
Backup Fire Attack Line	2	
Support for Multiple Functions	2	
Search and Rescue	2	
Ventilation	2	
Aerial Ladder Operation	1	
Initial Rapid Intervention Crew	2	
Total	15	

The above methodology, or similar versions, serve as the basis for the deployment criteria for the following structural fire protection recommended practices, as applied by the Insurance Services Office (ISO) and as recommended by the National Fire Protection Association (NFPA).

NFPA 1710

Founded in 1896 by representatives of the stock insurance industry, the National Fire Protection Association (NFPA) is a non-profit association that publishes codes, standards, and best practices related to fire protection and life safety. The association's documents are developed by more than 250 technical committees. The first standard published by NFPA related to the design and installation of fire sprinkler systems in commercial and industrial buildings. In 1904, NFPA's membership had expanded beyond the insurance industry to many other organizations and individuals devoted to fire protection.

The organization has developed a wide range of criteria that address almost every aspect of public fire protection and emergency services. Two standards, NFPA 1710 and 1720, can be used as guidelines for measuring the performance of fire, rescue, and emergency medical services. It is important to note the association's standards are often refenced as guides when determining the kind and level of services provided. However, under the standards of governance, the standards may not be enforceable unless a governing body officially adopts them as such. Advocates often site potential liability if the governing body does not abide by the standards, whether officially adopted or not. Often this view is shortsighted as there are now over 300 NFPA standards, many of which directly apply to the advocates who may not meet all that would be required of them.

NFPA 1710. *The Standard for the Organization and Deployment of Fire Suppression Operations, Emergency Medical Operations, and Special Operations to the Public by Career Fire Departments*. The standard is designed to measure the performance of career fire departments that utilize full-time or full-time-equivalent (FTE) station-based personnel, immediately available, to comprise at least 50 percent of an initial full alarm assignment.

Table 6.2: NFPA 1710 Structure Fire Response Performance Objectives [a]

Single-Family Dwelling, Open-Air Strip Shopping Center, and Apartment					
911 Call Taking	Dispatch Processing	Turnout Time	1st Arriving Engine	2nd Arriving Engine	Remainder of Assignment
Not more than 15 seconds 95% of calls/40 seconds 99% percent of calls received.	Not more than 64 seconds 90% of calls/106 seconds 95% of calls.	80 seconds 90% of calls	4-minutes (240 sec.)	6-minutes (360 sec.)	8-minutes (480 sec.)
High-Rise Buildings					
Not more than 15 seconds 95% of calls/40 seconds 99% percent of calls received.	Not more than 64 seconds 90% of calls/106 seconds 95% of calls.	80 seconds 90% of calls			

[a] All the above criteria must meet a performance criterion of 90%.

Insurance Services Office – Public Protection Classification Program

The Insurance Services Office (ISO) is a subsidiary of Verisk Analytics a for-profit company providing data and research on behalf of the property and casualty insurance industry. The most recognized service provided by ISO is its Public Protection Classification (PPC) program. In some shape or form, for over 100 years, the program and its predecessors have been used to grade a municipality's ability to prevent and mitigate its fire risks. The program assesses the severity of a community's fire risks and scores the effectiveness of the fire department and other municipal agencies in the prevention and control of fires in buildings and other fixed properties. Practically every city and town in the United States is graded by ISO on a five-to-ten-year basis.

The PPC program includes an onsite assessment of a community which, in turn, is used to classify a community for fire insurance purposes. An ISO Field Representative will conduct the PPC survey while applying ISO's *Fire Suppression Rating Schedule* (FSRS), the companion document of the PPC program. A community's classification is based on a scale of 1-10 with Class 1 being optimum fire protection and Class 10 being no recognized public fire protection. Most community in the U.S. are classified somewhere between a Class 3 and Class 7. The goal is for communities to maintain adequate public fire protection that is commensurate with their level of risks.

From 1980 through 2012, ISO applied the 1980 edition of the FSRS. The edition included a maximum of 100 credit points divided amongst the following categories:

Table 6.3: ISO Categories 1980-2012

Category	Maximum Points Available
Emergency Communications	10.0
Fire Department	50.0
Water Supply	40.0
Total	100.0

In 2013, ISO adopted the current FSRS that, along with the three above listed categories, now includes a fourth category that addresses the community fire prevention and mitigation activities.

Table 6.4: Current ISO Categories

Category	Maximum Points Available
Emergency Communications	10.0
Fire Department	50.0
Water Supply	40.0
Community Risk Reduction	5.50
Total	105.5

In addition, the current edition includes revised credit points and terminology.

Given its many benefits to the community and the individual property owner, it is not uncommon for local municipal officials to misinterpret or misapply the PPC program. Very often, some fire chiefs or elected officials may feel compelled to achieve the best rating possible. Though noble and with good intentions, a local community should always conduct a cost-benefit analysis before expanding and investing in more fire protection for the community.

During the onsite survey, the Field Representative reviews four major areas of the FSRS. Certain items within each area are assessed against the FSRS's criteria with an appropriate level of credit being awarded. Upon completion of the grading, a summary report is submitted to the community's administrator, fire chief, water authority management, and 911 emergency communications director. The report includes credit information for every item reviewed and the community's final score.

Emergency Medical Response Methodology

Most fire departments today, particularly career agencies, provide some level of emergency medical services. These services are provided through the use of a number of different delivery models, utilizing multiple configurations of public agencies and/or private providers. Nationally, no consensus exists on the model that provides the best form of patient care. Generally, the level and type of service is regional and patient care may vary widely in what is considered the best or most appropriate form of service.

Over the past 40-50 years, municipal fire departments have taken on the role of providing some level of emergency medical care. It is not uncommon today for the nearest fire station's unit,

usually an engine company, to respond to a medical emergency to augment the responding ambulance. In other communities, such as Troy, this service has expanded and the fire department provides advanced patient care and transport ambulance service. Currently, over 40 percent of transport ambulance service in the United States is provided by municipal fire departments. Services are provided by either fire company personnel cross-staffing ambulances, or the more preferred method whereby fire companies and ambulances are staffed separately.

Levels of Service. The level of patient pre-hospital care is provided through the following levels of service:

Basic Life Support. The above benchmarks assume the EMS system provides both Basic Life Support (BLS) and Advanced Life Support (ALS). Basic Life Support is generally provided by Emergency Medical Technicians (EMT) who are trained to provide pre-hospital care, including a rapid evaluation of a patient's condition and providing critical care such as maintaining a patient's airway, breathing, and circulation; controlling external bleeding; preventing shock; and preventing further injury or disability by immobilizing potential spinal or other bone fractures.

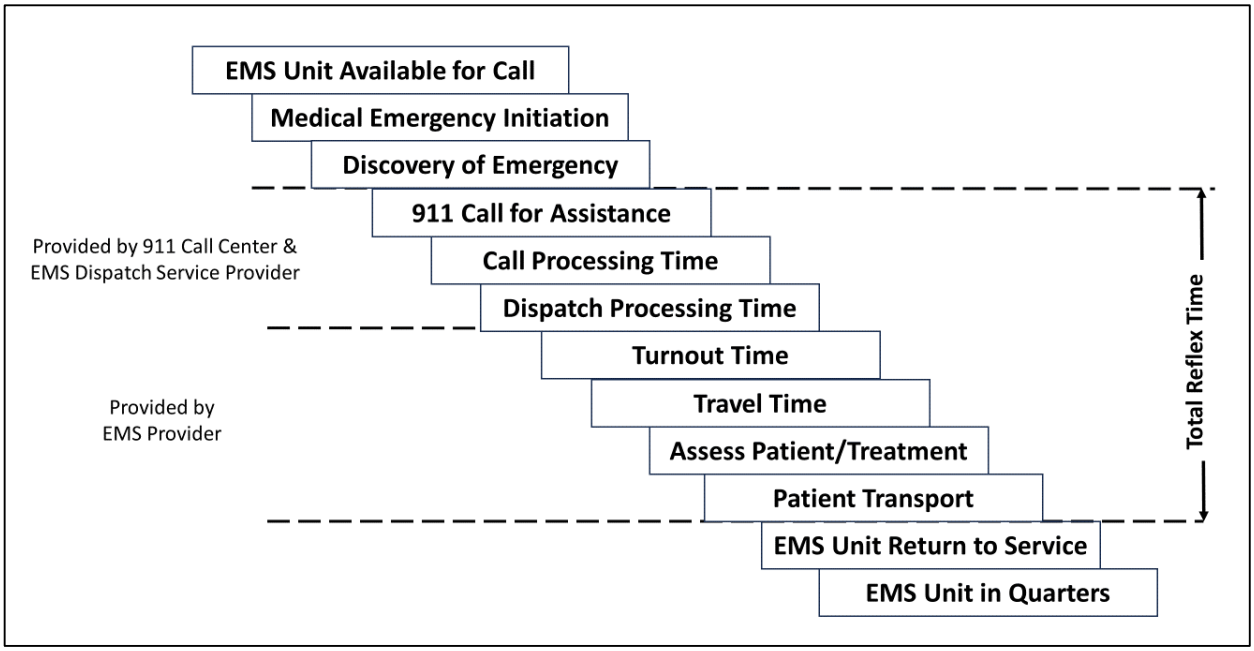
Advanced Life Support. Paramedic-level, or Advanced Life Support (ALS) is patient care beyond BLS that provides for advanced airway management, including intubation, advanced cardiac monitoring, defibrillation, establishment and maintenance of intravenous access, and drug therapy.

Varying configurations exists for the delivery of these services either by a preferred method or, as in some systems, determined by state regulations. As an example, in the state of New Jersey, fire department EMTs may provide BLS-level service when dispatched to a medical call, but law dictates that ALS service must be provided through the state's network of hospitals.

The TFD provides Emergency Medical Services at the ALS level, with all firefighters and company officers holding paramedic licensing through the state of New York. Paramedic-staffed engine and ladder companies are routinely dispatched to medical emergencies and accidents with ALS level ambulances.

EMS Response Sequence. Similar to the response to fires and other emergencies, the response to medical emergencies generally follows the response sequence as illustrated in Figure 6.5:

Figure 6.5: EMS Response Process



NFPA 1710

As with the organization and deployment of structural fire protection, NFPA Standard 1710 also provides criteria for the deployment of Emergency Medical Services. The standard defines Emergency Medical Care as:

"The treatment of patients using first aid, cardiopulmonary resuscitation, basic life support, advanced life support, and other medical procedures prior to arrival at a hospital or other health care facility."

The following provides an overview of the expected response performance for the delivery of Emergency Medical Services:

Table 6.5: NFPA 1710 EMS Response Benchmarks

911 Call Taking	Dispatch Processing	Turnout Time	BLS Travel time	ALS Travel Time
Not more than 15 seconds 95% of calls/40 seconds 99% percent of calls received.	Not more than 64 seconds 90% of calls/106 seconds 95% of calls.	1-minute (60 seconds)	4-minutes (240 seconds)	8-minutes (480 seconds) _

* All of the above criteria must meet a performance criterion of 90%.

The above criteria are reflective of a fire department-based EMS systems where ambulances are strategically located in selected fire stations throughout the city, and where all stations are housed with an engine company, or in some cases an engine and a ladder company. When

dispatched for a medical response, the nearest fire company is dispatched simultaneously with the nearest ambulance with the expectation that, under most conditions, the fire company will arrive within four minutes of the initial dispatch. Fire company personnel can begin providing aid to the patient prior to the ambulance's arrival.

New York State EMS Deployment Requirements

Under the provisions enacted by state legislation, Chapter 45 of the State of New York's Public Health Law provides emergency medical service systems minimum performance standards. Article 30, Section 3005-A of Chapter 45, stipulates the following criteria related to the deployment of emergency medical services:

Staffing standards; ambulance services, and advanced life support first response services:

1. The following staffing standards shall be in effect unless otherwise provided by this section:
    a. effective January first, nineteen hundred ninety-seven, the minimum staffing standard for a registered ambulance service shall be a certified first responder with the patient;
    b. effective January first, two thousand, the minimum staffing standard for a voluntary ambulance service shall be an emergency medical technician with the patient;
    c. the minimum staffing standard for all other ambulance services shall be an emergency medical technician with the patient; and
    d. the minimum staffing standard for an advanced life support first response service shall be an advanced emergency medical technician with the patient. Circumstances permitting other than advanced life support care by an advanced life support first response service may be established by rule by the state council, subject to the approval of the commissioner.
2. Any service granted an exemption by the regional council pursuant to subdivision five-a of section three thousand three of this article shall be subject to the standards and terms of the exemption.
3. Notwithstanding any other provision of this article, the effective date of the standards established by this section shall be delayed by one year for each fiscal year, prior to January first, two thousand, in which the amounts appropriated are less than that which would have been expended pursuant to the provisions of section ninety-seven-q of the state finance law.

Response Times

Response times are a key measure of service in the fire and emergency medical services. We relied upon data from the Troy Fire Department's records management system for these analyses. Normally, we compare this information with that received directly from the dispatch system to validate these records. The County's 9-1-1 Center was unable to produce incident data for this study, so we have less confidence in this data than we would normally as we will describe later.

We begin with analysis of the current station locations and their capacity to serve the city using a GIS-based drive-time analysis. Drive-time is only one component of response time, as discussed earlier in this chapter. We mapped the current station locations using two standards – the Insurance Services Office (ISO) and then NFPA 1710. The reader is reminded that neither of these standards are binding on the city or fire department, but they are well-accepted in the industry.

First, we look at ISO. This standard (in one of two options), requires that built-up areas of a fire protection service area be within 1.5 road miles of an engine company. This is shown in Figure 6.6.

This figure shows that almost the entirety of the built-up area of the city is within 1.5 miles of a fire station.

We next apply NFPA 1710 requirements, which are four minutes to 90 percent of incidents. We approximate this with using four-minute drive-time boundaries, shown here in light green (Figure 6.7). Again, nearly the entire city is covered.

With regard to EMS, Figure 6.8 shows drive-time coverage for Medic Units. The NFPA 1710 standard requires Medic Units arrive within eight minutes to 90 percent of incidents, provided that initial response by an AED-equipped first responder arrives within four minutes. Figure 6.6:

Troy 1.5 Mile Engine Coverage (ISO Criterion)

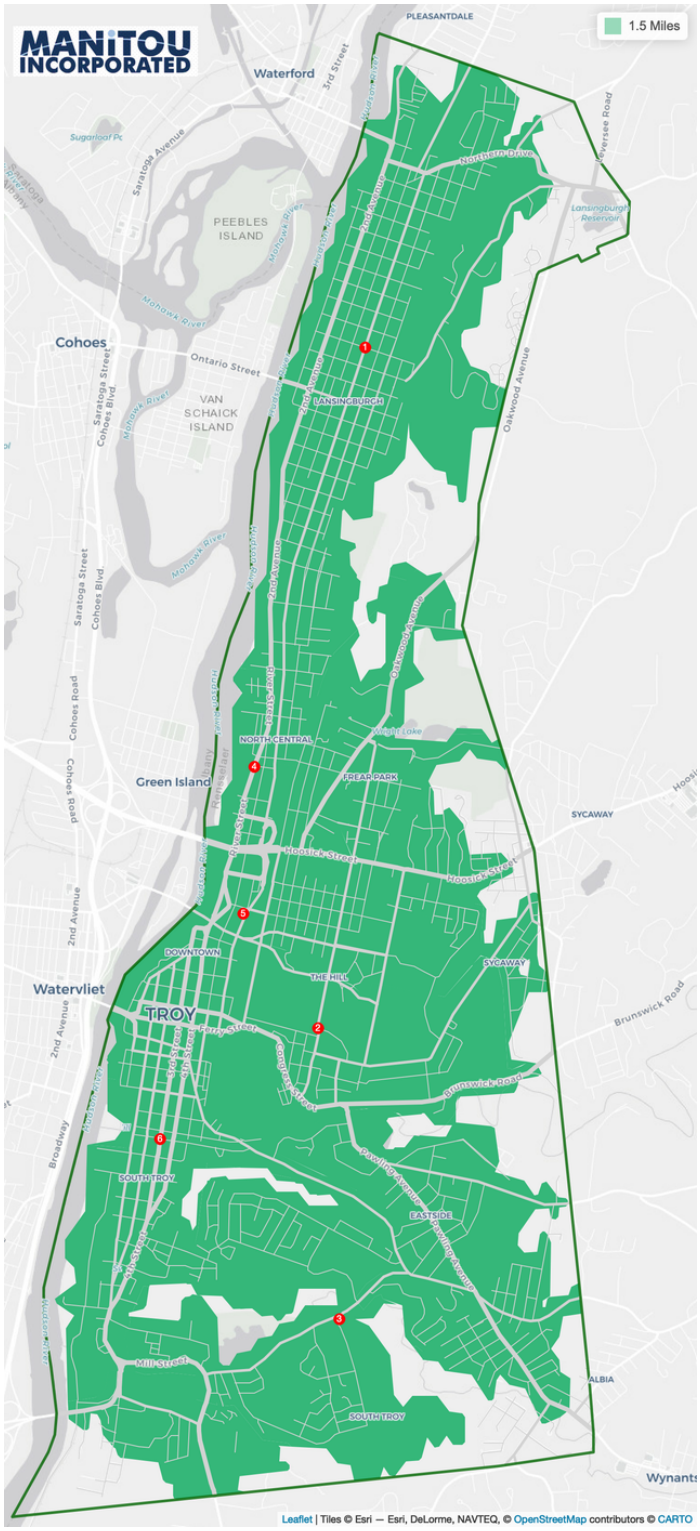


Figure 6.7: Troy 4-Minute Drive Time (NFPA 1710)

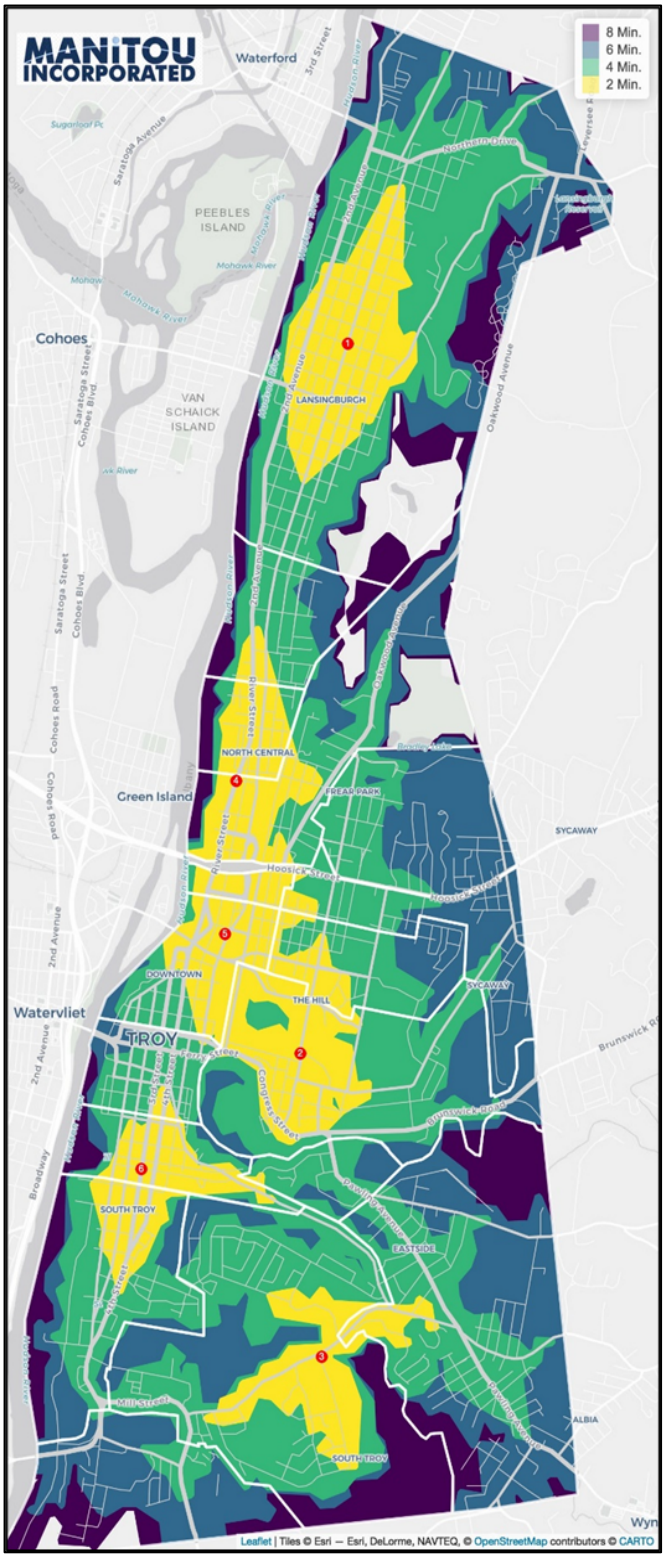


Figure 6.8: Troy Medic Unit Drive-Times (NFPA 1710)

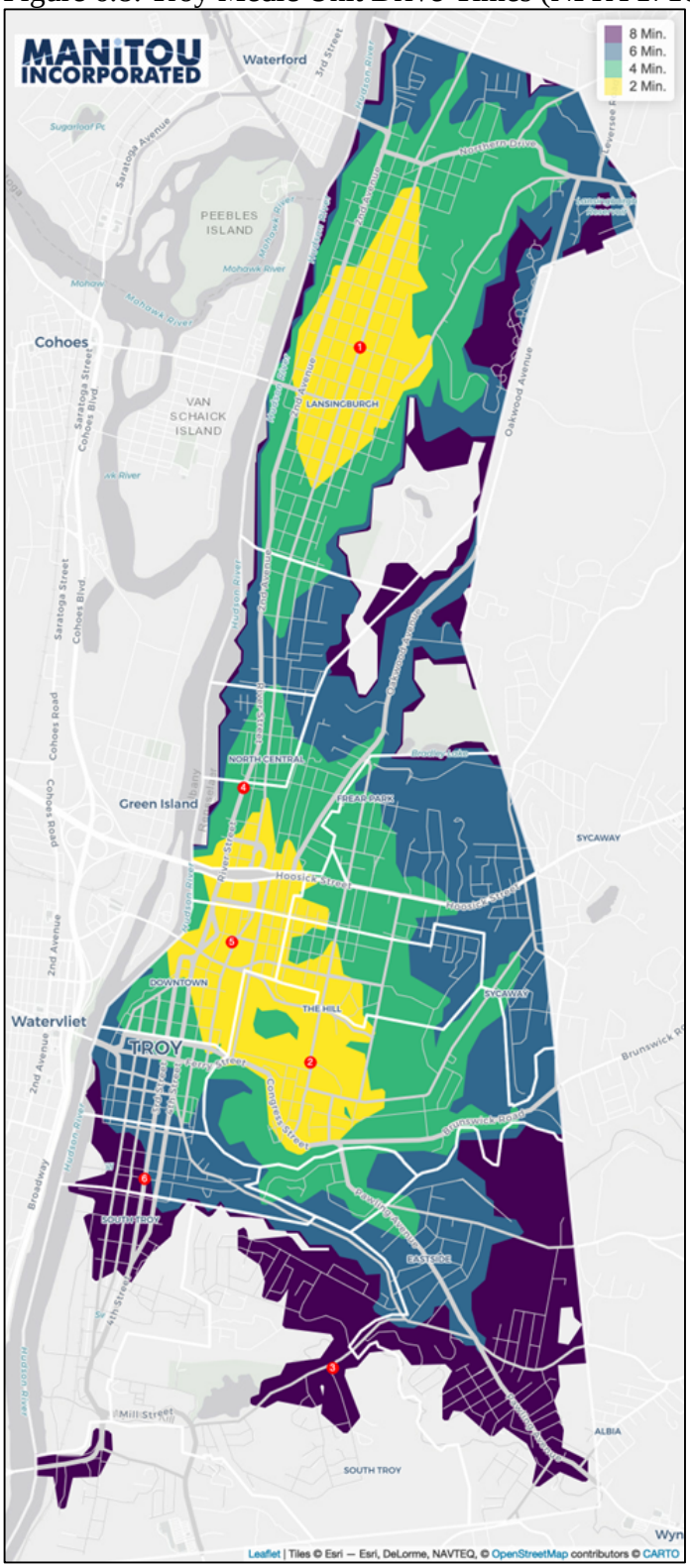


Figure 6.8 shows these units generally capable of serving all but the southwestern corner of the city within eight minutes.

Of course, drive-time analyses are static in that they show the capability when units are in quarters and available. As units become busier, as is the case in Troy, such static analyses are only a starting point. When units are unavailable, calls for service must be answered by the next nearest unit, meaning that calls may not be served by what is normally the closest available unit.

Table 6.6 shows the percentage of incidents in each engine company first-due area that is served by which engine. As expected, the majority of incidents are served by the assigned engine. We also see that a significant number of incidents are served by adjacent engine companies. This analysis included both single and multi-company responses.

Table 6.6: First-Arriving Unit, Engine Response Areas

First Due	First Arriving	Count	Percent
1	1	446	94.89%
1	2	1	0.21%
1	3	1	0.21%
1	4	20	4.26%
1	5	1	0.21%
1	9	1	0.21%
2	1	5	0.97%
2	2	388	75.49%
2	3	6	1.17%
2	4	60	11.67%
2	5	46	8.95%
2	6	6	1.17%
2	7	3	0.58%
3	2	22	7.24%
3	3	268	88.16%
3	6	14	4.61%
4	1	41	7.47%
4	2	17	3.10%
4	3	3	0.55%
4	4	390	71.04%
4	5	92	16.76%
4	6	3	0.55%
4	7	1	0.18%
4	9	2	0.36%

5	1	3	0.66%
5	2	90	19.78%
5	4	12	2.64%
5	5	344	75.60%
5	6	2	0.44%
5	7	1	0.22%
5	9	3	0.66%
6	1	2	0.51%
6	2	27	6.89%
6	3	23	5.87%
6	4	3	0.77%
6	5	18	4.59%
6	6	319	81.38%

The largest share of incidents served by the assigned engine are for Engine 1, which may reflect its relative isolation at the northern end of the city. The next highest percentage of coverage is for Engine 3, which covers 88 percent of its incidents as first-due incidents, first to arrive. Engine 6 is just behind at 81 percent. The remaining engines are in the 70s, meaning that at least one-quarter of the time another unit arrives first. This can be attributed to a mix of being out of service, or adjacent companies that are geographically close (for example, Station 2 and 5) arriving ahead of each other.

Recall that we do not have good multiple unit arrival times for most multi-company responses.

Using data from the TFD records management system (as supplied by the County 9-1-1 Center), we did analyses of response times. These data allow us to examine different components that constitute response time.

Table 6.7 shows average call processing and dispatch times for each unit. Call processing is the amount of time taken for answering the 9-1-1 line and gathering information from the caller. Once the nature of the incident is confirmed, the appropriate number of units must be assigned. Dispatching is the time it takes to select those units and transmit the alarm via a combination of radio and via electronic terminal in the apparatus.

Table 6.7: Call Processing and Dispatch 2019-2023

UNITNUM	2019	2020	2021	2022	2023
CAR4	3.3	3.1	2.9	2.9	2.7
ENG1	3.1	3.1	2.9	2.8	2.7
ENG2/M2	2.7	3.3	2.6	2.9	2.7
ENG3	3.4	3.4	3.2	3.1	2.9
ENG4	3.3	3.3	3.1	3.1	2.8
ENG6	3.2	3.2	3.1	3.0	2.8
MEDIC1	3.7	3.5	3.3	3.0	2.8
MEDIC2	3.6	3.7	3.5	3.5	3.2
MEDIC3				3.3	3.1
MEDIC4	3.2	3.2	3.2	2.8	2.8
RS1	2.7	2.6	2.6	2.3	2.3
T1/M1	3.5	3.4	2.4	2.7	3.9
TRUCK2	2.8	3.0	2.9	2.7	2.3

Call processing and dispatch times ranged from 2.3 to just over three minutes in 2023. The standard NFPA 1221, *Standard for the Installation, Maintenance, and Use of Emergency Services Communications Systems,* which is recognized by both NFPA 1710 and the ISO Schedule, requires all incoming 9-1-1 calls to be answered within 15 seconds (90th percentile) and 20 seconds for 95 percent of incoming calls. Processing is to occur within 60 seconds, 90 percent of the time.

Table 6.8: Turnout and Travel Time 2019-2023

UNITNUM	2019	2020	2021	2022	2023
CAR4	4.3	4.7	4.2	4.4	4.6
ENG1	4.1	4.1	4.3	4.4	4.5
ENG2/M2	3.8	3.9	4.8	4.3	4.6
ENG3	4.5	4.7	4.8	5.1	5.3
ENG4	3.8	3.9	4.0	4.4	4.6
ENG6	4.2	4.2	4.4	5.0	4.8
MEDIC1	5.3	5.6	5.2	5.5	5.7
MEDIC2	5.1	5.8	5.5	5.9	6.1
MEDIC3				6.0	6.3
MEDIC4	4.6	4.8	5.1	5.1	5.2
RS1	3.8	3.9	4.3	4.2	4.1
T1/M1	8.7	4.6	6.1	6.7	12.7
TRUCK2	3.0	3.0	3.5	3.2	3.5

Table 6.8 shows the combination of turnout and travel times. Turnout is that segment of time from when the station is alerted to an incident to when that unit leaves the station. Travel time is

the time from leaving the station until arrival on scene. Turnout and travel times were between 3.5 and 5.3 minutes for fire units, and five to six minutes for Medic Units.

These times do not include “alpha” responses, as these are responded to in a non-emergency mode. These averages, while reasonable, do not necessarily reflect meeting the requirements at the 90th percentile of standards, such as NFPA 1710. In particular, delays associated with responding back to quarters to staff a medic unit (particularly for Medic 1), may introduce longer times. The potential unavailability of fire companies cross-staffing medic units also reduces available fire staffing. Additional discussion of dispatching and response time issues are in the recommendations chapter.

Unit Activity

It is important to conduct the analysis to determine the activity and work load of each unit. Determining the workload of staffed units with a high frequency of activity hours could help determine which units are overworked or need to be relocated to another station.

Workload is a function not only of the number of responses a unit makes, but the amount of time in which it is unavailable for alarms. Table 6.9 shows the number of responses made by front-line Troy units from 2019 to 2023. The busiest unit is Medic 4, the only full-time Medic Unit in the Department. Rescue Squad 1, which serves a small area as Engine 5, is the next busiest unit for 2023.

Table 6.9: TFD Unit Activity 2019-2023

UNITNUM	2019	2020	2021	2022	2023
CAR4	754	598	649	898	760
ENG1	2202	1344	2035	2717	2257
ENG2/M2	536	425	471	1898	1207
ENG3	1164	789	1185	1596	1357
ENG4	2118	1393	1962	2573	2167
ENG6	1649	1066	1560	1796	1549
HAZMAT 50	4	1	2	7	3
MEDIC1	2150	1667	2115	2717	2130
MEDIC2	2155	1767	2395	1060	1118
MEDIC3	1	1	1	2618	1602
MEDIC4	3516	1933	3326	4469	3473
RS1	2555	1564	2546	3082	2474
T1/M1	137	158	163	198	165
TRUCK2	989	651	972	1297	972

We next examined the total hours spent in calls for each unit. Table 6.10 shows this data. The values shown in the table are obtained by calculating total time unavailable in minutes, then dividing by the number of minutes in a year (or half-year, for Medic 3).

Table 6.10: Unit Hour Utilization by Unit, 2019-2023

UNITNUM	2019	2020	2021	2022	2023
CAR4	0.05	0.04	0.04	0.06	0.06
ENG1	0.14	0.09	0.13	0.17	0.15
ENG2/M2	0.03	0.02	0.02	0.11	0.07
ENG3	0.08	0.05	0.08	0.11	0.10
ENG4	0.12	0.08	0.11	0.14	0.13
ENG6	0.10	0.06	0.09	0.11	0.10
MEDIC1	0.15	0.11	0.15	0.19	0.16
MEDIC2	0.13	0.11	0.15	0.06	0.07
MEDIC3	0.00	0.00	0.00	0.35	0.24
MEDIC4	0.22	0.12	0.21	0.27	0.23
RS1	0.13	0.08	0.14	0.16	0.14
T1/M1	0.01	0.01	0.01	0.02	0.02
TRUCK2	0.05	0.04	0.06	0.07	0.06

The utilization rates for the units are within acceptable levels, but are highest for the Medic Units. We should remember that since Engine 2 and Medic 2 are cross-staffed, and Medic 1 and Ladder 1 are cross-staffed, they are served by the same crew, and thus their UHU should be combined. This means that Ladder 1/Medic's UHU in 2023 was actually .18, meaning the crew was on incidents 18 percent of the time. For Engine 2/Medic 2, their combined UHU was .14.

Commentary on Deployment

Troy operates relatively more stations with fewer personnel than one would desire if designing a system from the ground up. The current arrangements are the result of two policy decisions: first, the decision to reduce staffing in the Department overall; and second, the decision to take on EMS transport activity.

As shown in the previous maps, the existing stations exceed the ISO standards for station location, and theoretically meet the NFPA 1710 4-minute drive time requirement. In practice, this is unlikely given that units are routinely operating outside their first-due areas, especially the medic units. The medic units effectively serve as city-wide units.

There is an understandable reluctance to consider closing an engine company (and its station). At first blush, closing a station, disbanding an engine company, and redistributing its staff to other units would permit the ladder companies to be staffed with three personnel and the Rescue Squad

to be staffed with four. However, the way the Department operates makes this challenging for a few reasons.

First, since both Medic and Medic 1 are cross-staffed by fire companies, these two units' personnel can't be readily redeployed. Both Ladder 1 and Medic 2 are cross-staffing ambulances, meaning that they can't be disbanded without affecting both sets of units.

There are limitations on station bays and capacity limits where a cross-staffed Medic unit could potentially be moved. Several stations are single-bay facilities that can't accommodate a second unit.

Also, both Ladder Companies are staffed with two personnel. There is a serious limitation on what a two-person crew can accomplish, which requires engine company staff to take on Ladder company roles during a working fire incident. Typical ladder company roles of raising ground ladders, rescuing trapped occupants, and manually ventilating roofs is extremely labor-intensive, and requires more than two personnel, especially considering that the vehicle operator usually stays at or near the vehicle in the event the aerial device must be operated or additional equipment is needed.

The Rescue Squad also serves as an engine company, albeit in a smaller first-due area established as a workaround. As a pumping apparatus located in the heart of the city, the Rescue Squad by necessity must arrive first on some share of incidents and be placed in a position to operate as an engine company. This compromise was made when the engine formerly housed at Station 5 was disbanded.

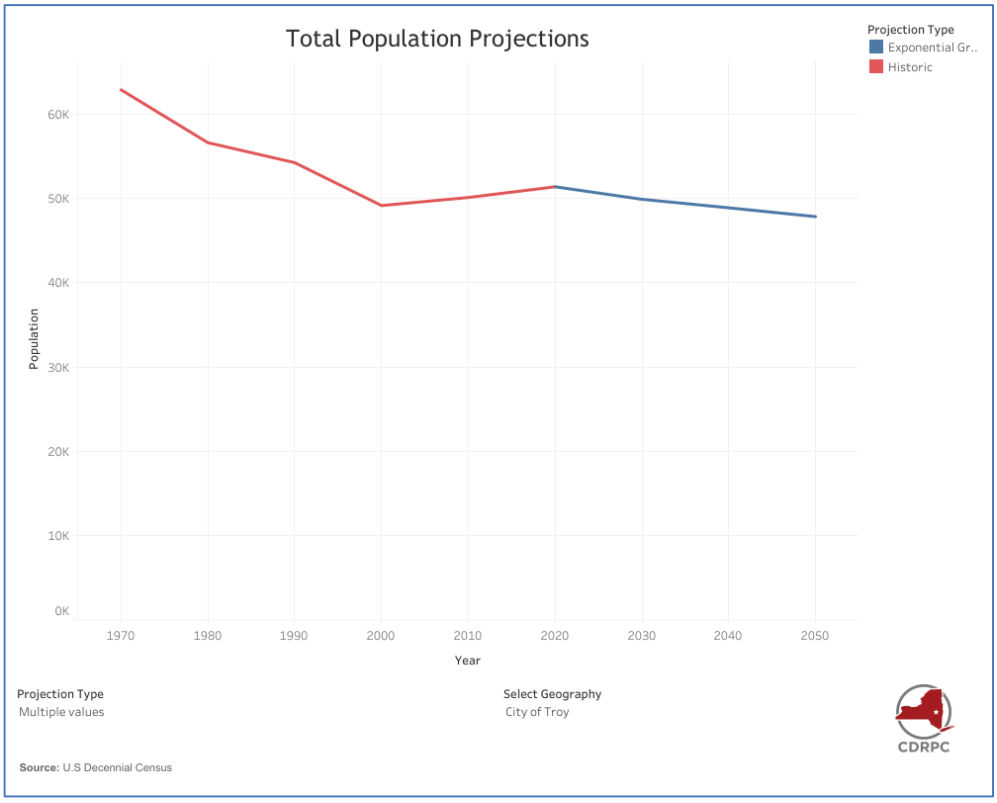
The unavoidable conclusion is that the TFD operates with minimal staffing, given their workload, and the challenging service area they must protect.

7. FORECAST OF INCIDENTS, 2024-2044

As part of this study, we were tasked with developing a 20-year forecast of incidents in the city of Troy. In order to develop a forecast of future incidents, we begin by analyzing recent experience to identify patterns and trends. Emergency incidents are generally a function of population and the built environment. Changes in either the composition of the population (more or less aging or medically vulnerable population) or the built environment (for example, new buildings constructed with sprinkler systems) can affect both the number and mix of incidents experienced by a community.

After declining for nearly a century from its high of 76,813 in 1910, Troy's population stabilized around 50,000, with the decade between 2000 to 2010 marking the first increase in population. The city's population increased slightly from 2010 to 2020, but declined again slightly according to 2023 Census estimates. In terms of future growth, the city does not produce its own long-range forecasts. We used population forecasts from the Capital District Regional Planning Commission (CDRPC).[10] Those forecasts show the City's population remaining essentially flat through 2050 (Figure 7.1).

Figure 7.1: Troy Population Forecast



[10] https://cdrpc.org/data/population/population-projections/capital-district-population-projections

The Census Bureau's American Community Survey (ACS) produces estimates of population using a different methodology between decennial census administrations. These are often very useful, especially as decennial estimates get further from the date of measurement. The ACS *does* show that the City's population actually decreased from 2020 to 2023.

This CDRPC forecast does not reflect the recent efforts to promote infill and adaptive reuse of buildings within the city. Quantifying the number of new residents that may result from these projects is uncertain, but it is likely that the city will experience some growth in the near term as these projects come on line. Quantifying this population growth is a challenge and area of uncertainty.

Preliminary data from the Department of City Planning shows that there were over 2,300 new housing units approved by the Planning Commission between 2018 and 2022. Of these, there were about 700 building permits approved, meaning that these represent an expansion of three percent of housing units in the city over the last five years. To put these numbers in perspective, there were about 24,325 housing units in Troy in 2020.

Assuming an occupancy of two people per unit, this equates to 1,400 residents, assuming that the occupants are not drawn from other housing within the city.

To understand the relationship between population and emergency incidents, we summarize emergency incidents by four broad types: Fires; EMS/Rescue; False alarms; and Other (Table 7.1). Using these four categories allows us to capture differential rates of change among the incident types. Fires are based on NFIRS 100 series incidents; EMS is NFIRS 300 series incidents; False Alarms are NFIRS 700 series, and Other are all remaining types.[11]

Table 7.1: Major Incident Types 2019-2023

	2019	2020	2021	2022	2023
Fire	185	239	209	235	234
EMS	7782	6956	7983	8635	8059
False Alarms	1753	1561	1716	1860	2030
Other	1207	1312	1579	1736	1884

While incidents of all types increased over the past five years, there was variation, with most fluctuating at least once over the period 2019-2023. There is a clear pattern of increase by over 600 incidents for Other incidents, which includes reported gas leaks, good intent calls, and service or general public assistance calls.

The first step in the forecast process is to divide the numbers of incidents annually by the city's population. Because the city's population change is small, most of the change in utilization is attributable to changes in the number of incidents. Table 7.2 shows that there were 4.62 fire-

[11] For a complete explanation of incident types, please see Chapter 5 on Demand for Service.

related incidents per 1,000 population in 2023. For EMS, incidents varied more widely, but increased markedly from 2021 to 2022. Both False Alarms and Other incidents increased considerably over the same five-year period.

Table 7.2: Incidents by Major Type per 1,000 Residents

	2019	2020	2021	2022	2023	Average	Average Annual Growth Rate	Compounded Annual Growth Rate
Fire	3.61	4.65	4.09	4.62	4.62	4.3	1.075	0.06
EMS	151.68	135.28	156.07	169.72	159.25	154.4	1.018	0.01
False Alarms	34.17	30.36	33.55	36.56	40.11	35.0	1.045	0.04
Other	41.01	41.75	51.18	58.47	60.66	50.6	1.106	0.10

Table 7.2 shows the actual rates, average annual growth, and the compounded annual growth rate.
These increases are significant and suggest some underlying change in the nature of demand within the city. In most locales, changes are more subtle and less consistent in terms of increase.[12]

To estimate future demand, we use these ratios of incidents to population to form two forecasts – a low and high forecast. The low forecast uses steady per capita incident rates, multiplied by population in each time period, to estimate the number of incidents. Any change in demand is attributed to changes in population.

The high forecast applies a growth rate (where appropriate) to the per capita utilization rate of incidents by broad category. Given the increasing per capita demand for service within Troy, this forecast is likely to be more accurate, at least for the near term. The high forecast methodology applies a compounded growth rate to per capita utilization, but this produces very large increases over longer time frames, so we usually adjust growth rates downward to reflect a more realistic forecast over longer time periods.

The two forecasts should be thought of as an envelope of likely demand for service. Equally important, the timing of the forecast demand is not as important as the milestones that demand may represent in terms of claim on resources within the Department.

Forecasts

As discussed previously, we believe that the CDRPC population forecast underestimates the likelihood of modest population growth in the city of Troy. To reflect this, we assumed that each

[12] The changes suggest that resident population may not be reflecting the number of people in the city, or increased utilization on a per capita basis.

year going forward the city would grow by 200 residents, meaning that by the end of the forecast in 2042, we would expect the city's population to be 54,807, or an increase of 4,200 residents.

Low Forecast. The low forecast is shown in Table 7.3, below. In this forecast, we use 2023 utilization rates and apply them based on the increased population. Under this forecast, we expect the TFD to respond to over 14,000 incidents by 2024.

Table 7.3: Low Forecast (Assumes population growth)

Incident Type	2023	2025	2030	2035	2040
Fire	234	236	240	245	250
EMS	8059	8123	8282	8441	8600
False Alarm	2030	2046	2086	2126	2166
Other	3070	3094	3155	3216	3276
Total	13393	13499	13764	14028	14293

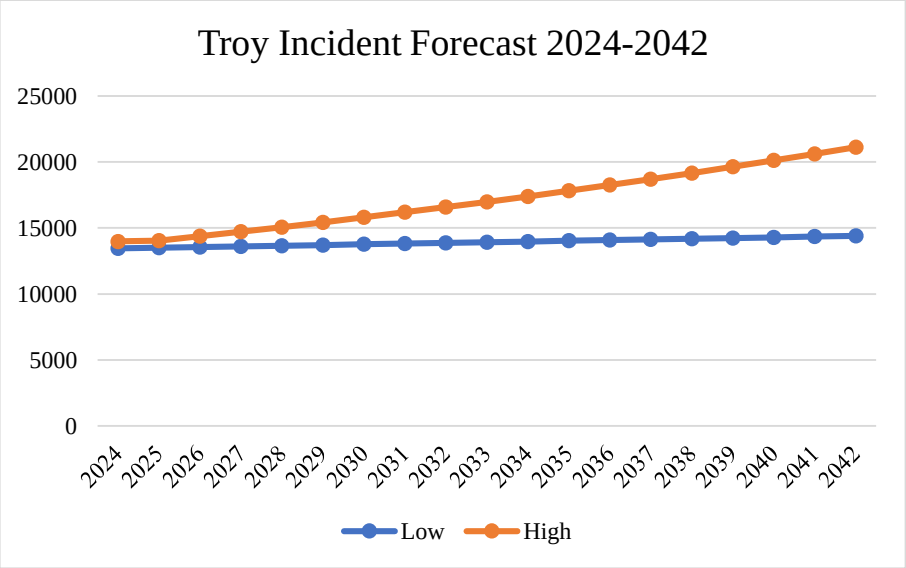
High Forecast. We next discuss the high forecast. Under the high forecast, we use past trends in increased utilization of incidents to permit increased demand, through both increased population and higher utilization. Growth rates were selected based on recent patterns, but lower rates were selected to reflect the fluctuation and uncertainty of the twenty-year forecast period.

Table 7.4 shows the high forecast. In the high forecast, we see much greater growth, with over 20,000 incidents annually by 2024. The total incidents from the forecasts are shown in Figure 7.2.

Table 7.4: High Forecast (Assumes population growth and annualized change in utilization)

Incident Type	2023	2025	2030	2035	2040
Fire	234	244	270	300	333
EMS	8059	8421	9404	10512	11761
False Alarm	2030	2126	2387	2684	3023
Other	3070	3247	3742	4321	5001
Total	13393	14038	15804	17817	20118

Figure 7.2: Troy Emergency Incidents Forecast



7.1.1. Aging of Population

The forecast methodology is robust, and many factors are captured by looking broadly at demand in terms of population and per capita utilization of service. One underlying dynamic may be the aging of the population within the city. The share of residents aged 65 and over is increasing within the city (Table 7.5). The increased utilization of emergency medical services among the aging population is well-established.

Table 7.5: Population Aged 65 or Over

Year	2010	2020	2023 (ACS)
Percent of population 65 and over	11.8	12.2	13.4

Source: 2010 S0101: AGE AND SEX - Census Bureau Table; 2020 Census Bureau Tables; 2023 U.S. Census Bureau QuickFacts: Troy city, New York

To gain some insight into this phenomenon, we performed some analysis using the patient data from TFD ambulance incidents. For incidents in which a patient care report was completed, we tallied incidents by age of the patient. In 2023, there were 2,358 incidents with patients aged 65 or over, compared with a resident population of 6,781. In terms of a per capita rate per 1,000 residents, this means that there were 347.7 ambulance incidents for every 1,000 residents 65 and over. This is more than double the utilization rate for the population at large.

The percentage and absolute number of residents over 60 is also increasing in Troy. From 2010 to 2020, the population aged 60 or greater increased by 13 percent (7,718 to 8,944).[13]

[13] https://cdrpc.org/regional-growth-trends-storymap

Unit Response Impacts

Of course, incidents require response from one or more units within the system. Relating the number of incidents to responses is challenging, because as units become busier, the likelihood that they are unavailable increases. However, we can approximate the number of unit responses, assuming that incidents are distributed spatially in the same pattern going into the future. For Troy, given that it is largely being built-out, this is a reasonable assumption.

Table 7.6: Unit Responses 2019-2023

UNITNUM	2019	2020	2021	2022	2023
CAR4	754	598	649	898	760
ENG1	2202	1344	2035	2717	2257
ENG2/M2	536	425	471	1898	1207
ENG3	1164	789	1185	1596	1357
ENG4	2118	1393	1962	2573	2167
ENG6	1649	1066	1560	1796	1549
HAZMAT 50	4	1	2	7	3
MEDIC1	2150	1667	2115	2717	2130
MEDIC2	2155	1767	2395	1060	1118
MEDIC3	1	1	1	2618	1602
MEDIC4	3516	1933	3326	4469	3473
RS1	2555	1564	2546	3082	2474
T1/M1	137	158	163	198	165
TRUCK2	989	651	972	1297	972

Commentary on Forecasts and Future Development

One concern that was raised within the city government is that certain housing developments require a disproportionate demand on fire and EMS services. As more of these developments come on line, it is expected that there will be an increase in demand for responses.

The most common incident locations are shown in the following table. A list of the top 50 addresses are in the Appendix, but those shown here correspond to addresses with at least one incident per week in 2023.

Table 7.7: Top Incident Locations

Address	2019	2020	2021	2022	2023
2902 Tibbits Avenue 12180 Troy, NY	53	50	356	590	250
49 Marvin Avenue 12180 Troy, NY	44	50	70	186	182
2405 15th Street 12180 Troy, NY	60	29	160	163	168
2256 Burdett Avenue 12180 Troy, NY	51	32	76	125	159
2100 6th Avenue 12180 Troy, NY	125	91	90	173	148

2 1st Street 12180 Troy, NY	79	51	59	121	126
2920 Tibbits Avenue 12180 Troy, NY	37	22	104	150	123
2121 6th Avenue 12180 Troy, NY	89	57	79	133	115
59 Harris Road 12182 Troy, NY	151	100	85	99	108
720 Federal Street 12180 Troy, NY	105	82	75	103	104
41 114th Street 12182 Troy, NY	98	60	97	88	81
21 1st Street 12180 Troy, NY	58	33	64	108	71
1300 Massachusetts Avenue 12180 Troy, NY	167	97	48	82	70
55 State Street 12180 Troy, NY	81	45	49	59	70
125 River Street 12180 Troy, NY	70	40	26	64	67
599 River Street 12180 Troy, NY	55	46	47	51	67
74 Ferry Street 12180 Troy, NY	61	47	48	72	66
2200 Burdett Avenue 12180 Troy, NY	8	9	34	54	64
250 5th Avenue 12182 Troy, NY	36	22	23	28	60
400 block 1st Street 12180 Troy, NY	3	1	67	83	59
222 9th Street 12180 Troy, NY	0	0	96	76	52

The top 15 locations are dominated by senior housing of various types, including assisted living, nursing homes, and apartments. Samaritan Hospital, Troy Police headquarters, and an urgent care facility are also among the top 15 locations. The balance of these properties are apartments and shelters.

A detailed analysis of incidents among recent projects occupied within the city was undertaken by a city staff member. This analysis included the number of units, number of incidents, and whether the development was market rate, mixed market rate, or affordable housing (Table 7.8). While we were unable to precisely reproduce the analysis, using our data we found that affordable units utilize fire/EMS services at roughly three times the rate of market rate units. This does not control for the number of occupants per unit.

Table 7.8: Planning Submissions 2022-2024YTD

Address	Description	Units	Subsidy/Occupancy
2024			
200 Broadway		27	Market
125 River St	Taylor II	308	Affordable
230 2nd St	Row house apartments	31	Market/Condo
2902 Tibbitts Ave	Assisted living	55	Senior
1011 2nd Ave	Apartments	175	Mixed
487 Campbell Ave		12	
Eddys Ln	Townhouse-style apartments	92	
Dunleer Dr. Ext.	Duplex Homes	19	Market
1420 5th Ave	Prospect Landing	60	Affordable
1st and Ida	Poestenkill Place	82	Affordable

74 New Turnpike Rd	Cottage style	80-90	Senior 55+
2023			
625 7th Ave	Catholic Central	98	Market
1818 5th Ave	Micro units	39	Market
155 River St		16	Market
171 River St		14	Market
Congress and 6th	City Station North	84	Market
547 River St		123	Affordable Senior
406 Fulton St		40	Market
1776 6th Ave		64	Market/Student
2022			
150 River St	Taylor Phase I	140	Mixed
255-259 Cemetery Rd	3 Buildings	97	Market
2001 5th Ave		40	Market
750 2nd Ave		150	Affordable
King Landing II		62	Market
101-119 Country Gardens		140	Market

To better understand future impacts of development, we made requests to the Planning Department and, in addition to this, TFD staff assembled a list of development projects culled from meeting records over the past three years. These projects may not yet be under construction, while some are nearing completion or already in occupancy. While speculative, the number and pace of development projects seeking approval suggests that the city has potential for even greater growth in the future. Nonetheless, it strongly suggests that future development will increase the calls for service that must be answered by the TFD.

8. Member Survey

A part of our consultation with the Department, the Manitou team met with the leadership of the Troy Firefighters Local 86. At that time, it was requested that a general engagement with the membership would be desirable. After meeting with the Executive Board, the decision was made to develop and administer a membership survey to obtain information from the membership on several subjects and general levels of satisfaction.

The city agreed with our recommendation, and Manitou staff developed a survey, which was circulated to the city and the Union's Executive Board for comments. The survey was approved with no significant changes.

An electronic survey was distributed via email to all employees of the fire department in March 2024. The survey was sent via a hyperlink in the body of an email with a message from the consultants. The solicitation also included contact information if any member wanted to speak with a member of the consultant team or had any supplemental information to be shared.

Several reminders were sent and the survey closed in April 2024. We received 87 responses, which represents 70 percent of the Department's staff.

The survey is designed to measure member sentiment, as a means to amplify quantitative analyses, and also to understand perceptions.

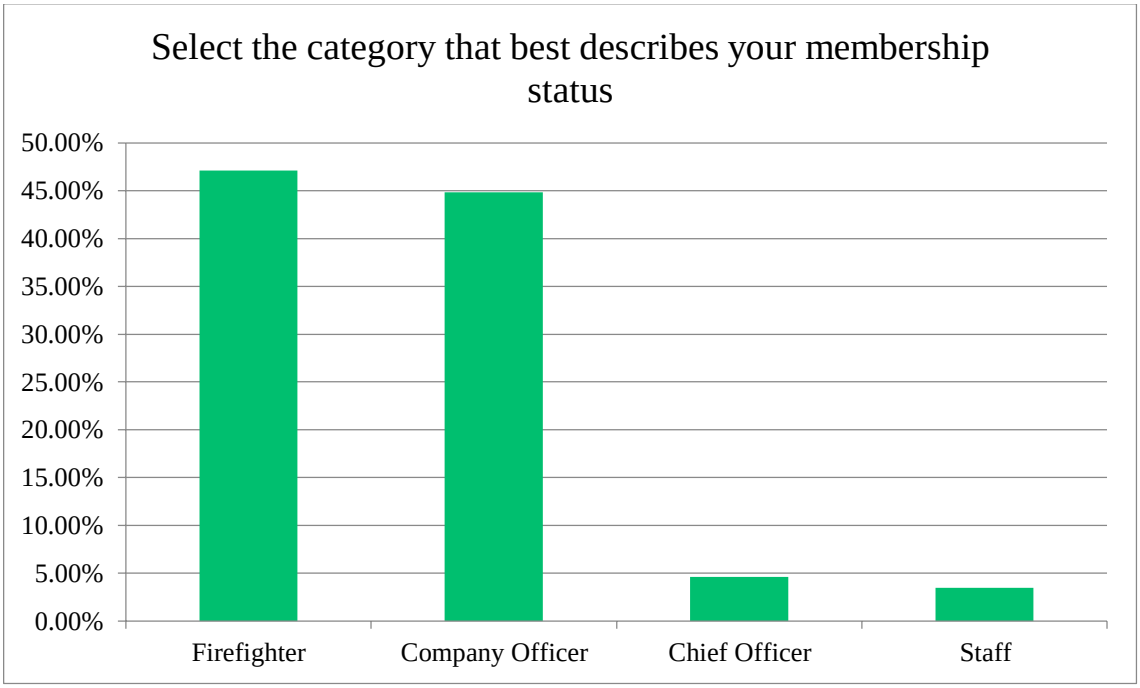
It is important to bear in mind that perceptions may not necessarily be entirely consistent with objective information. While they are critically important, they may reflect long-held beliefs or be influenced by impactful incidents that may be somewhat distant in the past. Several circumstances changed just prior to or during the study – namely the change in Mayoral administrations, a new Fire Chief, and passage at the State level of improvements to the pension plan, which was a long-standing priority of public employees.

Understanding perceptions is necessary to identify concerns and shape communication, policy, and actions to address these issues.

Demographic Information

The first section of the survey (Figure 8.1) dealt with basic demographic information about the respondents. This included age, years of experience, rank, and firehouse assignment.

Figure 8.1: Respondents by Rank



Of the respondents, most (47 percent) were firefighters, while just under 45 percent (39 responses) were company officers (Lieutenant or Captain). Less than 5 percent of responses were received from Chief Officers or civilian staff.

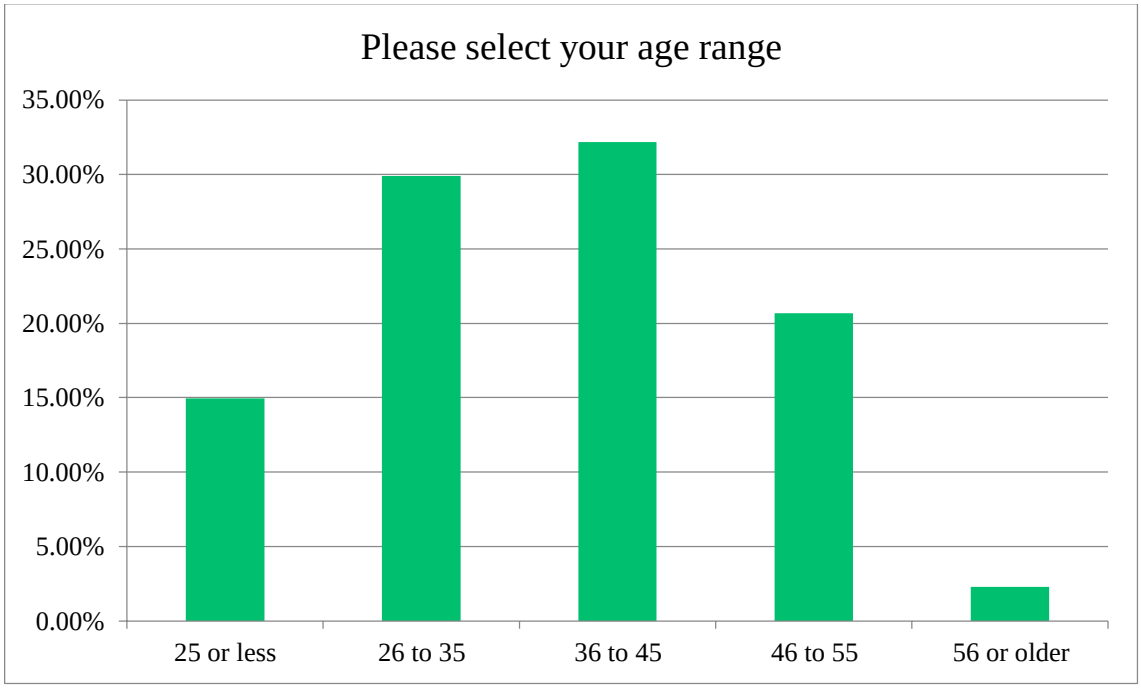
Responses were received from all stations, although most responses were received from Station 5 (headquarters), with the least from Station 3, which had 5 responses (Table 8.1).

Table 8.1: Responses by Station

Station	Number	Percentage
1	12	13.8
2	12	13.8
3	5	5.8
4	9	10.3
5	40	45.0
6	9	10.3

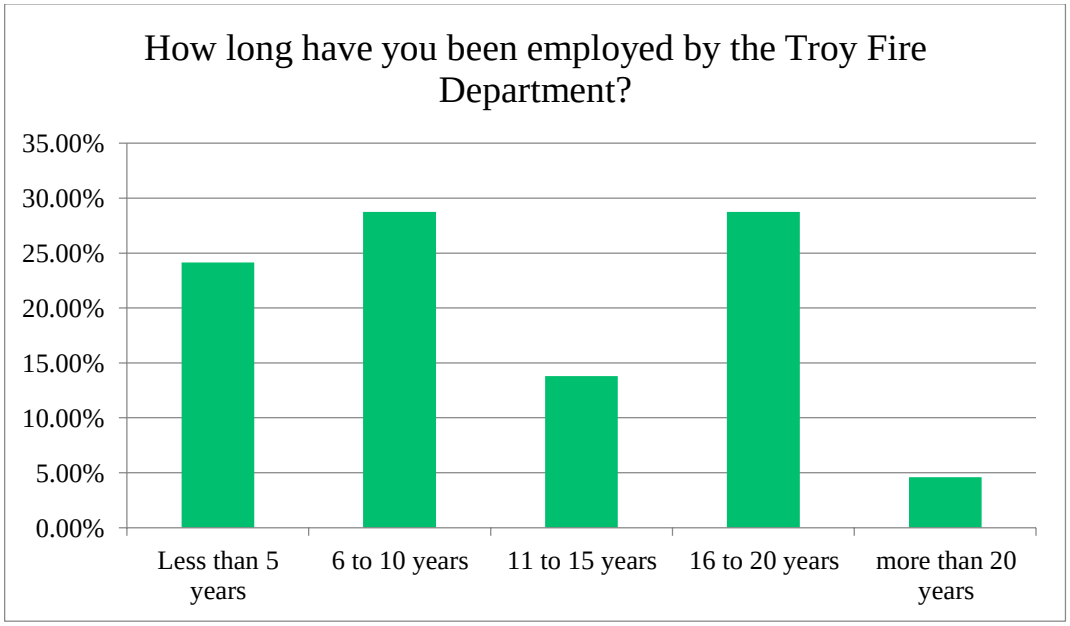
We next asked participants their age (Figure 8.2). The most common group was 36 to 45 years old, followed by 26 to 35 years old. Fifteen percent of respondents reported being aged 25 or less. Less than three percent of respondents were 56 or older.

Figure 8.2: Age of Respondent



In terms of years of experience within the Department, the most common ranges were 16 to 20 years and 6 to 10 years. The “less than five years” category was 15 percent of respondents. As with the age question, it appears that more senior members did not participate in the survey.

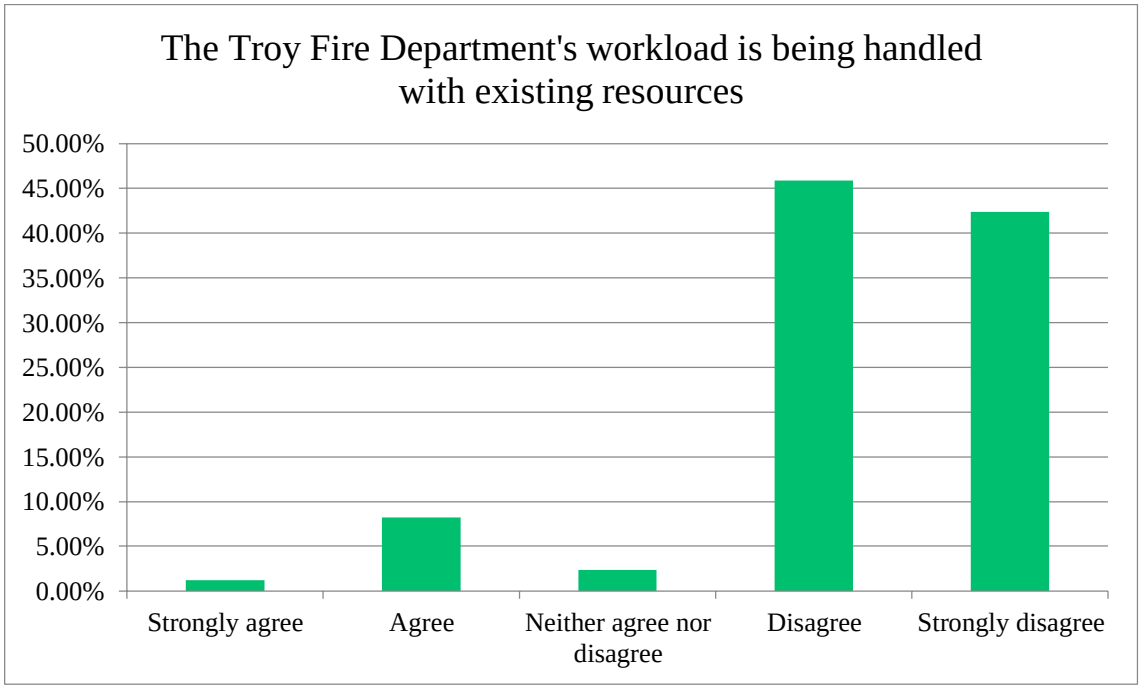
Figure 8.3: Years of Experience



Workload and Resources

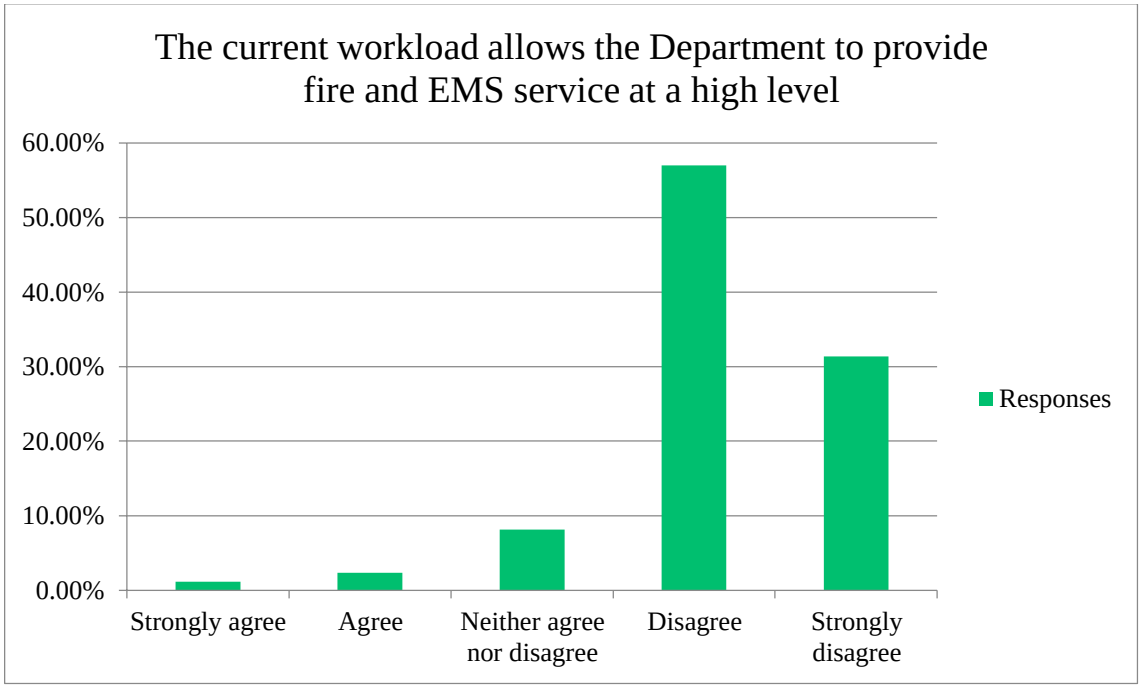
The next section of the survey asked about workload and resources within the Department (Figure 8.4). The first question asked if the emergency response workload is being handled with existing resources. Almost 90 percent of responses disagreed or strongly disagreed with the statement. Less than 10 percent of respondents agreed, including only one person who "strongly agreed."

Figure 8.4: Adequacy of Existing Resources



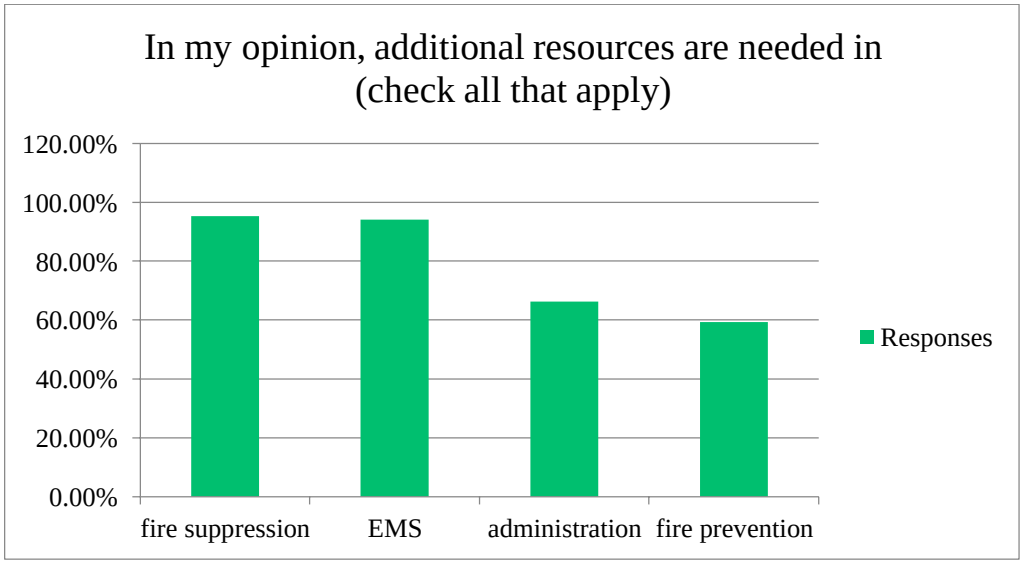
To gain insight on quality-of-service delivery, we asked if the current workload allowed the Troy Fire Department to provide fire and EMS service at a high level (Figure 8.5). While a similar percentage of respondents answered "disagree" or "strongly disagree," eight percent were neutral, and only three responses indicated some form of agreement. This question on quality of service had slightly more positive responses than the question on handling the workload, indicating that a slightly larger percentage of members felt that while the workload may be excessive, it had not yet impacted quality of service.

Figure 8.5: Service Provided at a High Level



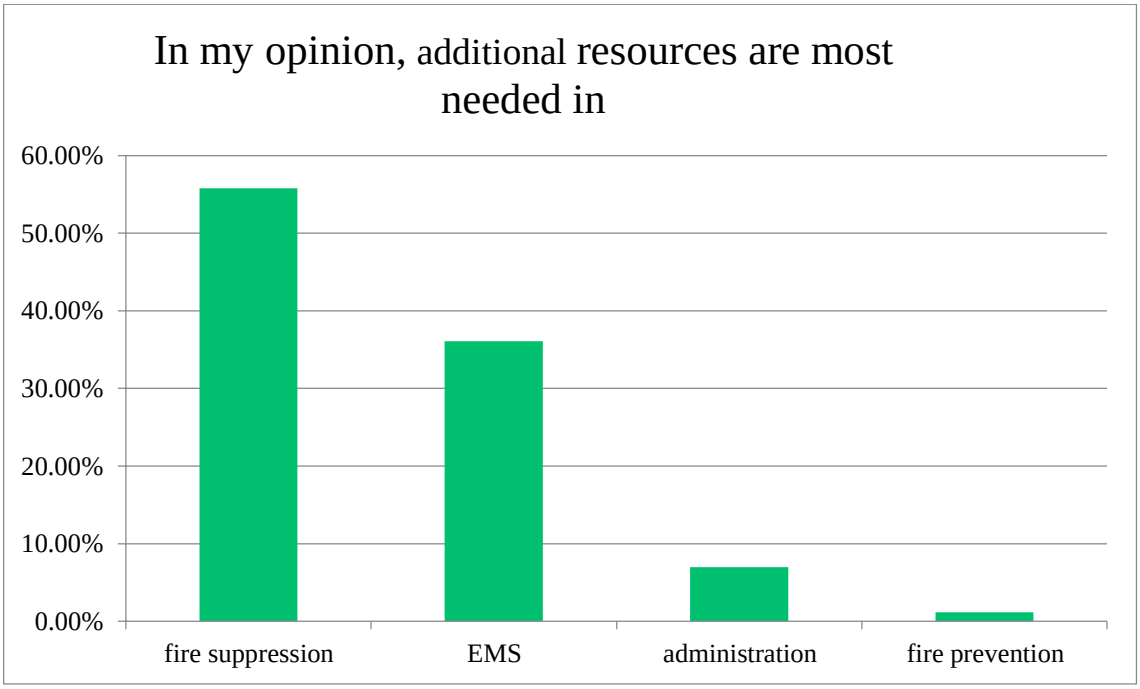
To better understand *where* resources may be needed, we asked members to note all the areas where additional resources are needed (Figure 8.6). Ninety-four to ninety-five percent of respondents indicated that more resources were needed for fire and EMS, respectively. Two-thirds of members suggested that more resources were needed in administration, and nearly sixty percent said more resources were needed in fire prevention.

Figure 8.6: Additional Resources Needed



When asked where resources are *most* needed (only one answer was permitted), members selected fire suppression (56 percent), followed by EMS (36 percent). Only about seven percent selected "administration" and only one person chose "fire prevention" (Figure 8.7)

Figure 8.7: Where Are Additional Resources Most Needed



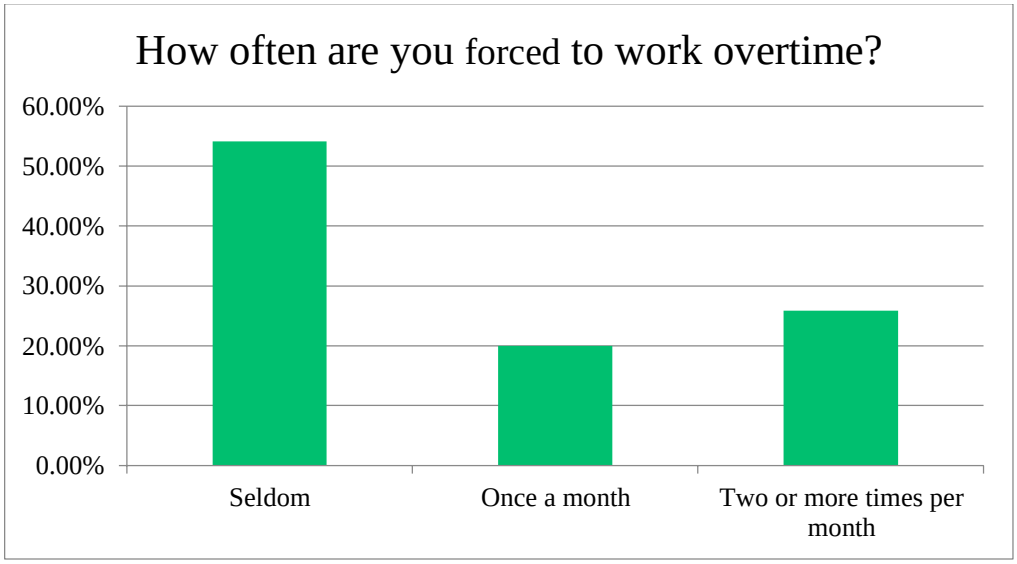
Overtime

In interviews with Department staff, the Union, and in the city's request for proposals, use of overtime was identified as an important issue. We attempted to understand the attitudes toward use of overtime and willingness to work additional shifts. The Department is in an unprecedented staff shortage, which has required record-setting overtime.[14]

We first asked "How often are you forced to work overtime?" This implies overtime being mandatorily assigned. About 45 percent of respondents indicated that they had been forced to do overtime once or twice a month. Some 54 percent indicated that they were only "seldom" required to work overtime (Figure 8.8).

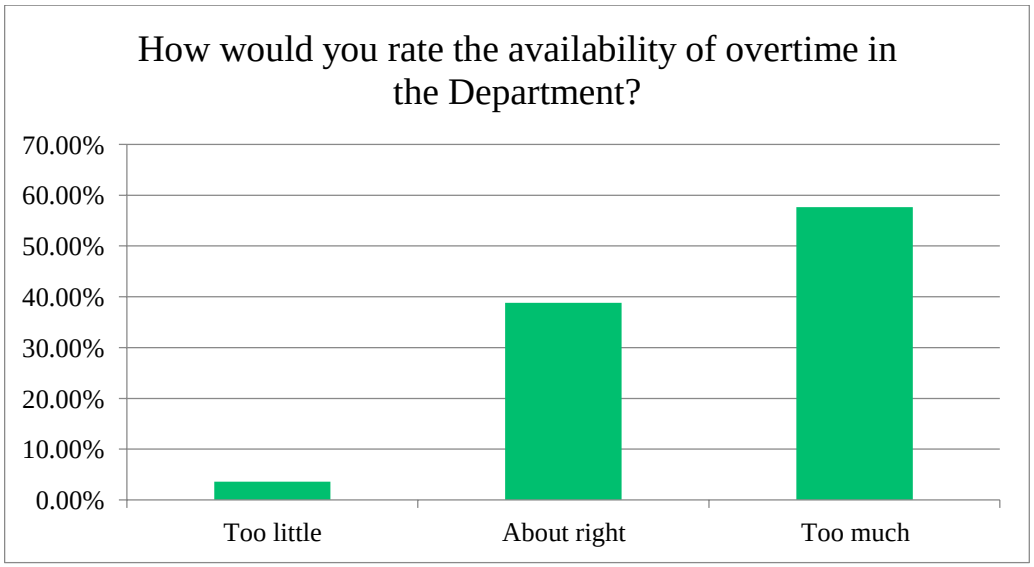
[14] We did not distinguish between safety staffing and overtime, although members may be restricting their answers to overtime only.

Figure 8.8: How Often Are Your Forced to Work Overtime



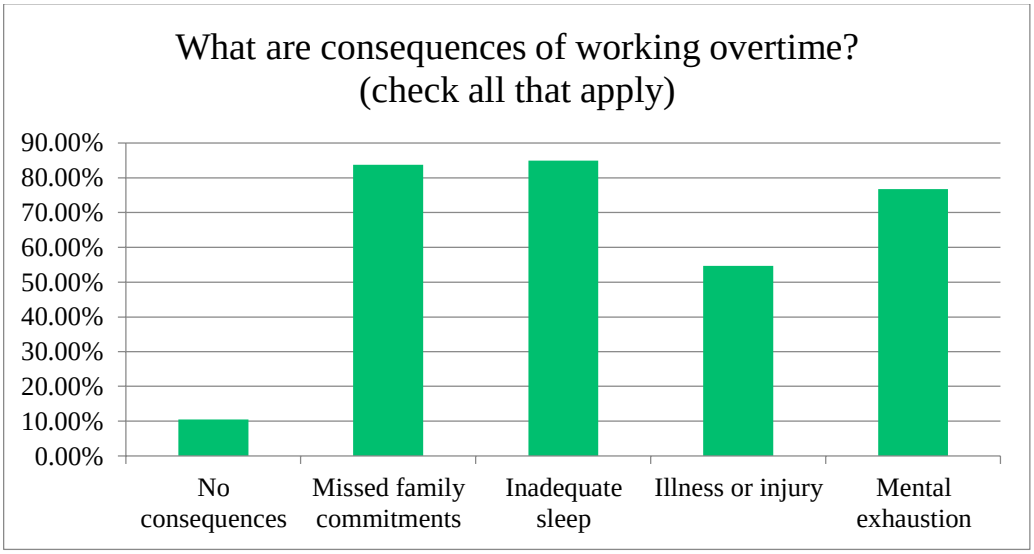
The question of how availability of overtime was rated was intended to capture elective overtime (Figure 8.9). Interestingly, 49 respondents (58 percent) stated "too much." About 39 percent of members indicated "about right", and only 3.5 percent of responses were "too little."

Figure 8.9: How Would You Rate Availability of Overtime



To measure impacts of working overtime on members, we asked "what are the consequences of working overtime?" Multiple responses were allowed (Figure 8.10). Only 10 percent indicated "no consequences." However, inadequate sleep and missed family commitments were cited by 84-85 percent of members. Just over three-quarters of members expressed "mental exhaustion." Almost 55 percent of respondents stated that illness or injury resulted from working overtime.

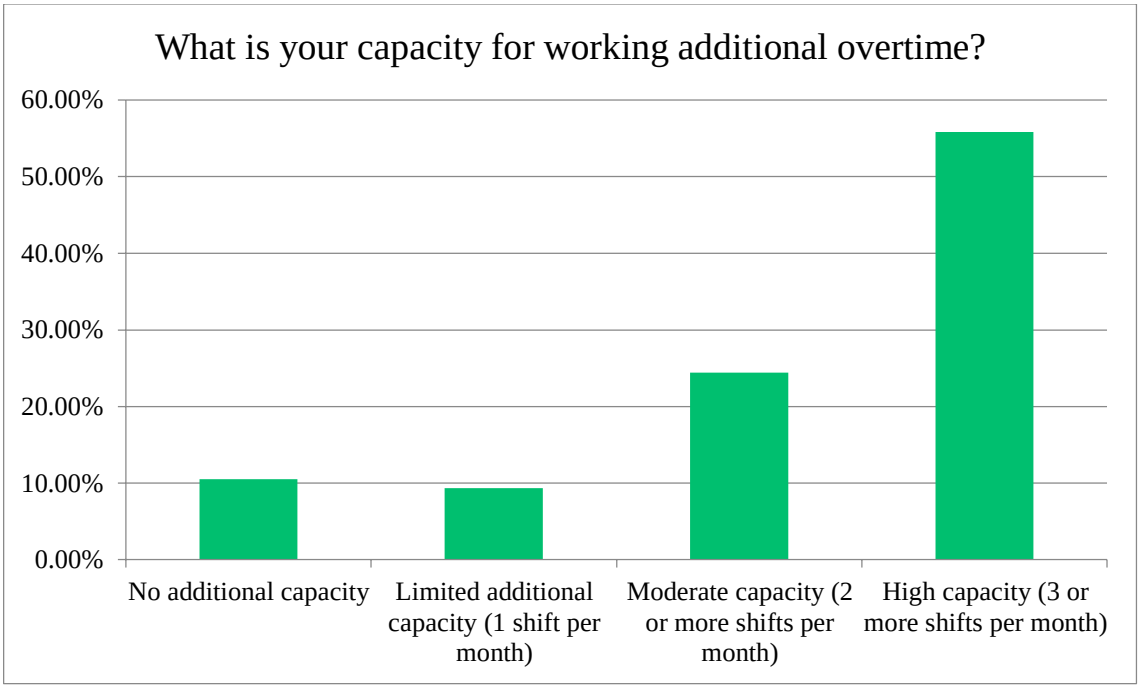
Figure 8.10: Consequences of Working Overtime



The last overtime question concerned members' capacity to work additional overtime shifts (Figure 8.11). In spite of the previous concerns raised about overtime, 56 percent of members stated that they had high capacity (ability to work three or more shifts per month). Another 25 percent of members said they could work two or more shifts per month. Nine members indicated that they had no additional capacity for overtime.

In spite of the sentiment against overtime, members responding to the survey indicated their ability to take on additional shifts.

Table 8.11: Capacity for Overtime



Job Satisfaction

The next series of questions sought to measure opinion on satisfaction with various aspects of the Department's programming and administration. A few questions asked about overall satisfaction.

These questions were answered on a five-point scale between "highly satisfied" (5) and "highly dissatisfied" (1). A score averaging 3.0 would correspond to "neither satisfied or dissatisfied."

We first asked about satisfaction over the past year, with the condition of facilities, vehicles, and equipment. Average scores for facilities were 2.45, vehicles were 2.32, and equipment was 2.71. The overall rankings were net negative for all three categories, but most negative for apparatus. Figure 8.12 and Table 8.2 show the results.

Figure 8.12: Satisfaction with Physical Plant and Equipment

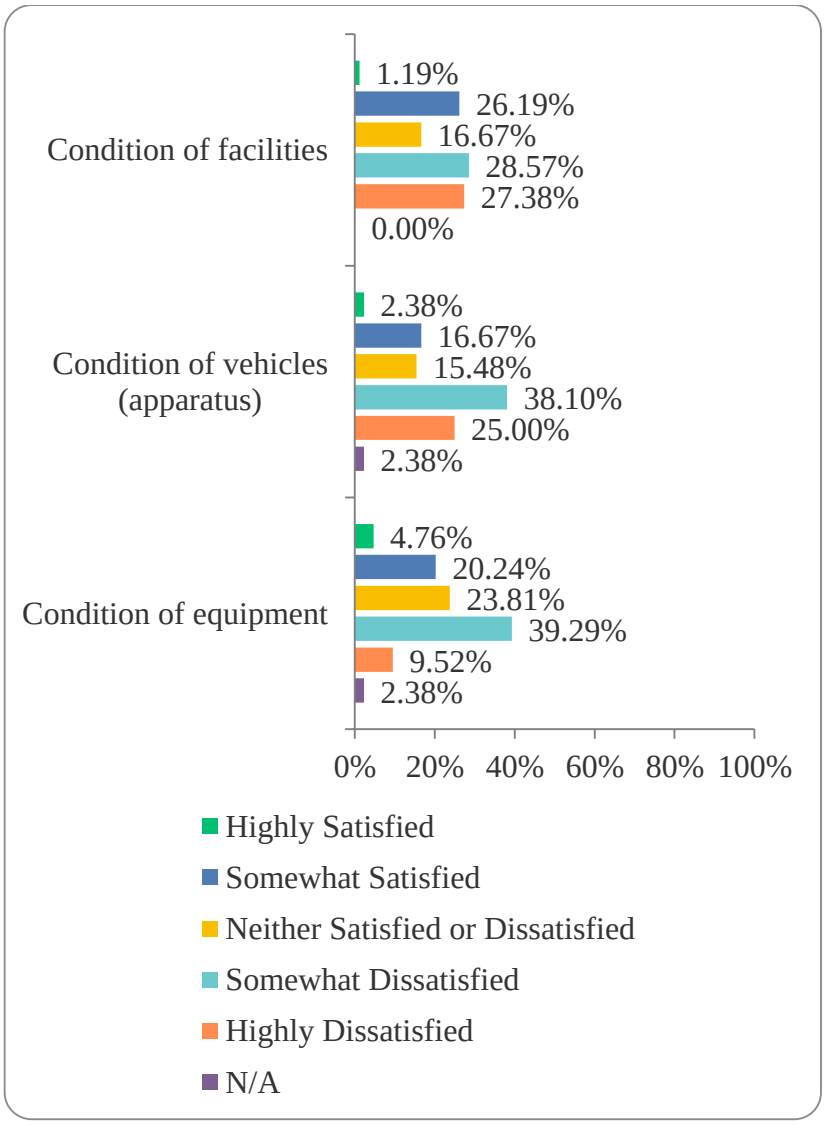

Condition of facilities
1.19%
26.19%
16.67%
28.57%
27.38%
0.00%
Condition of vehicles (apparatus)
2.38%
16.67%
15.48%
38.10%
25.00%
2.38%
Condition of equipment
4.76%
20.24%
23.81%
39.29%
9.52%
2.38%
0%
20%
40%
60%
80%
100%
Highly Satisfied
Somewhat Satisfied
Neither Satisfied or Dissatisfied
Somewhat Dissatisfied
Highly Dissatisfied
N/A

Table 8.2: Satisfaction with Physical Plant and Equipment

In the last year, what level of satisfaction do you have in the following areas?												
	Highly Satisfied		Somewhat Satisfied		Neither Satisfied or Dissatisfied		Somewhat Dissatisfied		Highly Dissatisfied		N/A	
Condition of facilities	1.19%	1	26.19%	22	16.67%	14	28.57%	24	27.38%	23	0.00%	0
Condition of vehicles (apparatus)	2.38%	2	16.67%	14	15.48%	13	38.10%	32	25.00%	21	2.38%	2
Condition of equipment	4.76%	4	20.24%	17	23.81%	20	39.29%	33	9.52%	8	2.38%	2

The next question asked about the Department's ability to maintain these same assets (Figure 8.13 and Table 8.3). This was intended to capture ongoing maintenance activities and, perhaps, reflect ongoing improvements. Average scores were slightly better, with all three categories nearly equal (facilities 2.83; apparatus 2.76; and equipment 2.88). This possibly reflects a recognition that, in spite of some poor conditions, efforts to improve have been recognized.

Figure 8.13: Satisfaction with Maintenance

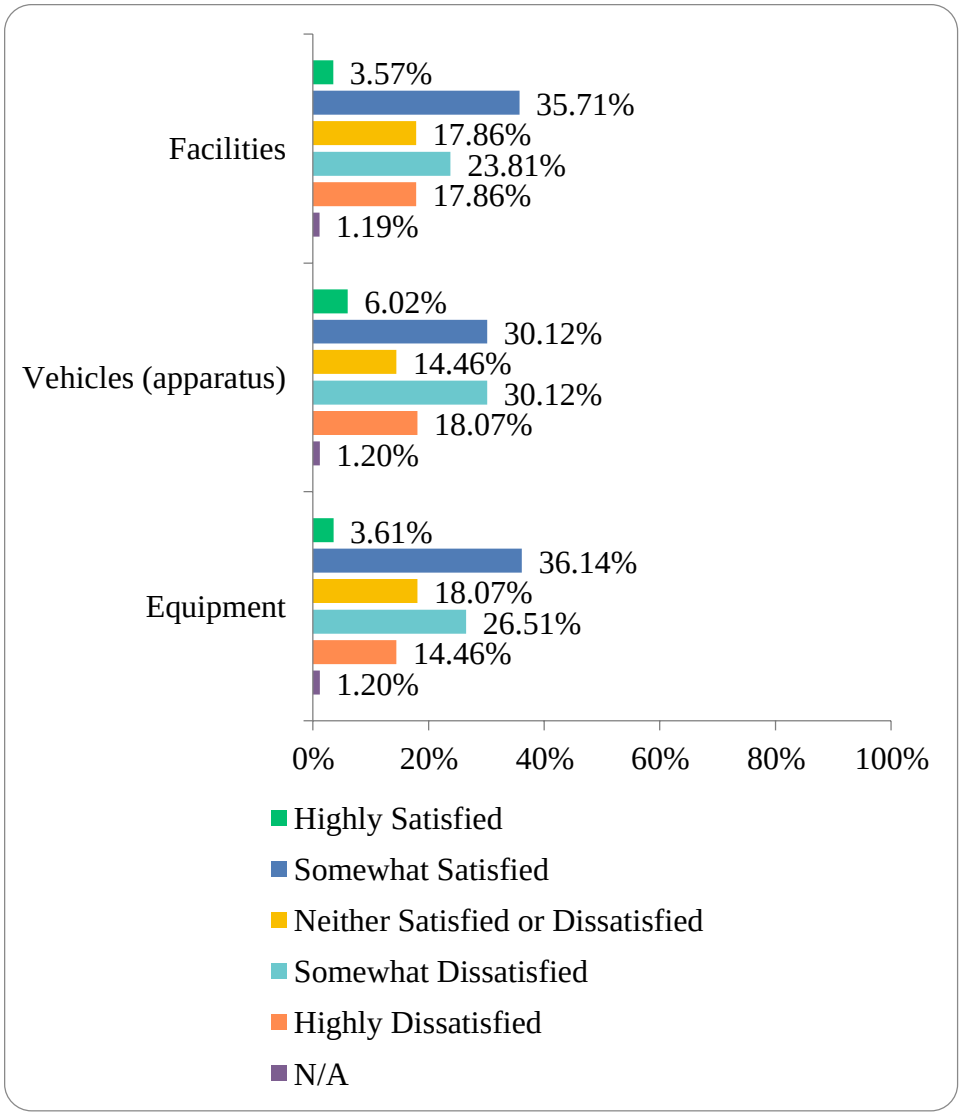


Table 8.3: Satisfaction with Maintenance

In the last few years, what level of satisfaction do you have in the efforts by the Department to maintain the following:												
	Highly Satisfied		Somewhat Satisfied		Neither Satisfied or Dissatisfied		Somewhat Dissatisfied		Highly Dissatisfied		N/A	
Facilities	3.57%	3	35.71%	30	17.86%	15	23.81%	20	17.86%	15	1.19%	1
Vehicles (apparatus)	6.02%	5	30.12%	25	14.46%	12	30.12%	25	18.07%	15	1.20%	1
Equipment	3.61%	3	36.14%	30	18.07%	15	26.51%	22	14.46%	12	1.20%	1

We next asked about training across several domains (Figure 8.14 and Table 8.4). For each area we asked about both frequency of training and quality of training over the past year. The most common response for each category (except quality if fire training) was “highly dissatisfied.” These are concerning findings.

Figure 8.14: Satisfaction with Training

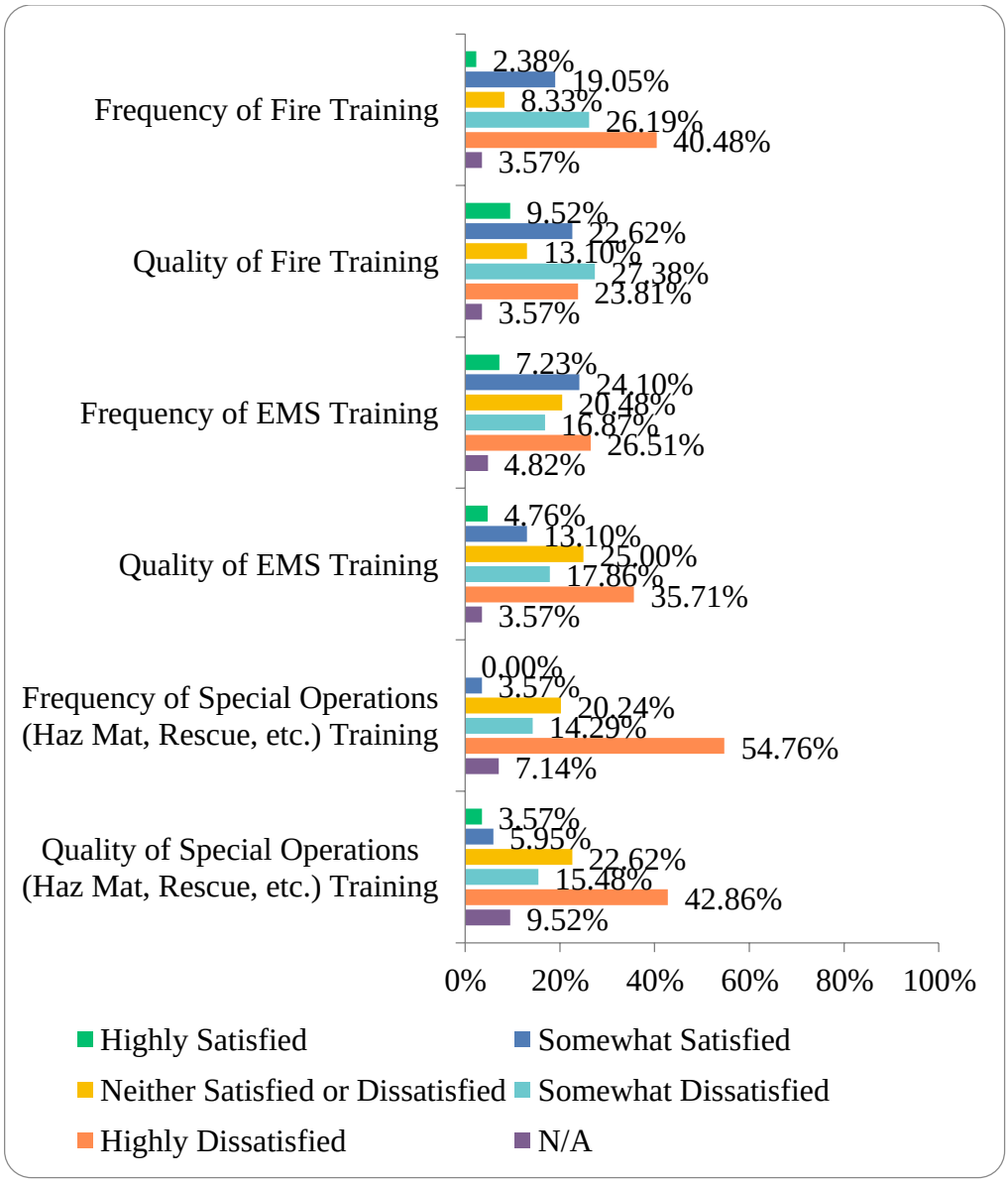


Table 8.4: Satisfaction with Training

In the last year, what level of satisfaction do you have in the following areas of training?												
	Highly Satisfied		Somewhat Satisfied		Neither Satisfied or Dissatisfied		Somewhat Dissatisfied		Highly Dissatisfied		N/A	Total
Frequency of Fire Training	2.38%	2	19.05%	16	8.33%	7	26.19%	22	40.48%	34	3.57%	3	84
Quality of Fire Training	9.52%	8	22.62%	19	13.10%	11	27.38%	23	23.81%	20	3.57%	3	84
Frequency of EMS Training	7.23%	6	24.10%	20	20.48%	17	16.87%	14	26.51%	22	4.82%	4	83
Quality of EMS Training	4.76%	4	13.10%	11	25.00%	21	17.86%	15	35.71%	30	3.57%	3	84
Frequency of Special Operations (Haz Mat, Rescue, etc.) Training	0.00%	0	3.57%	3	20.24%	17	14.29%	12	54.76%	46	7.14%	6	84
Quality of Special Operations (Haz Mat, Rescue, etc.) Training	3.57%	3	5.95%	5	22.62%	19	15.48%	13	42.86%	36	9.52%	8	84

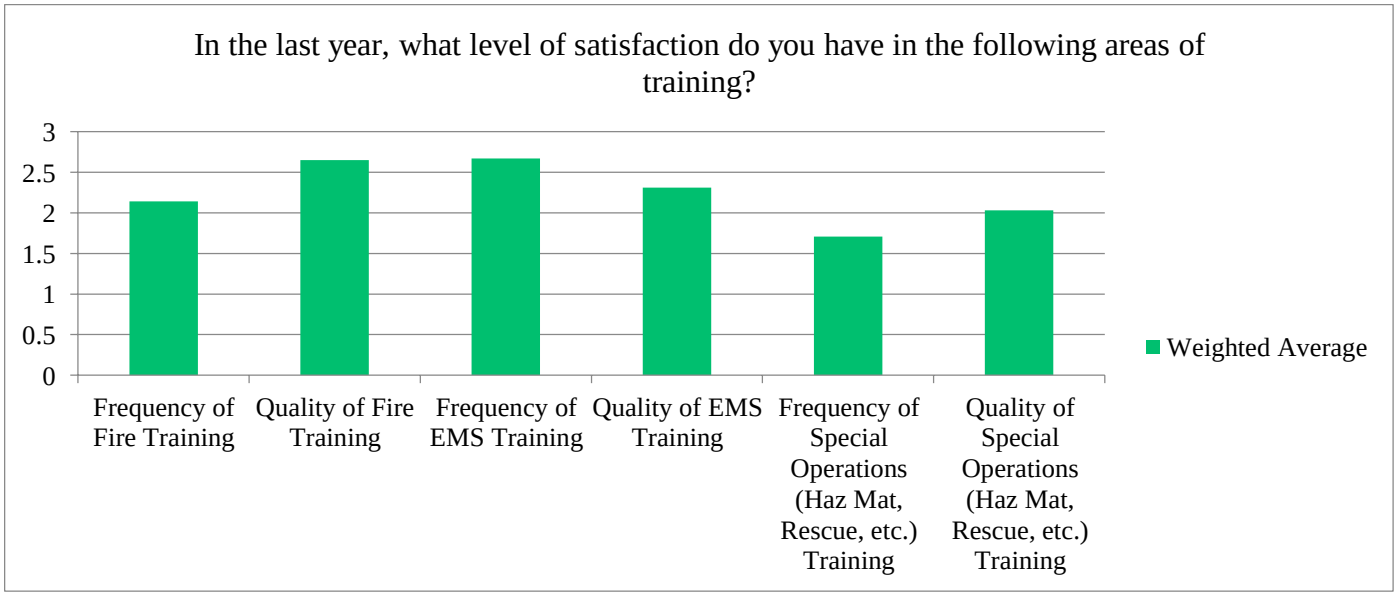
For frequency of fire training, 66 percent of respondents were unhappy with the frequency of training versus 21 percent who were satisfied. With regard to quality of training, just under a third of respondents were satisfied, while 50 percent were dissatisfied.

For EMS training, 31 percent of respondents were satisfied with frequency of training, while 43 percent were dissatisfied. For quality of training, only 17 percent were satisfied, while 52 percent were dissatisfied.

For Special Operations training, which includes subjects of hazardous materials, specialized rescue, etc., over 68 percent of respondents were dissatisfied with frequency of training. Only three respondents were "satisfied," with none being highly satisfied. With regard to quality of special operations training, less than 10 percent were satisfied, while 58 percent were dissatisfied with the quality of training.

Members generally expressed dissatisfaction with training and, given the Department's prominent role in special operations and their support of the county, this is an area warranting further attention. The overall weighted rankings by area are summarized in Figure 8.15.

Figure 8.15: Weighted Averages for Satisfaction with Training


In the last year, what level of satisfaction do you have in the following areas of training?
3
2.5
2
1.5
1
0.5
0
Frequency of Fire Training
Quality of Fire Training
Frequency of EMS Training
Quality of EMS Training
Frequency of Special Operations (Haz Mat, Rescue, etc.) Training
Quality of Special Operations (Haz Mat, Rescue, etc.) Training
Weighted Average

The final question on satisfaction focused on various dimensions of the job. The question asked, “in the last year, indicate your fulfillment with the following components of the job.” A range of activities was presented, knowing that some are much more prominent in the daily routine of work than others.

Figure 8.16 presents averaged rankings by area. Weighted rankings were (in descending order) firefighting, fire related incidents, vehicle extrication/rescue, technical rescue, Advanced Life Support transport, Basic Life Support or non-transport calls, fire prevention inspection, and public education.

Figure 8.16: Average Satisfaction with Job Components

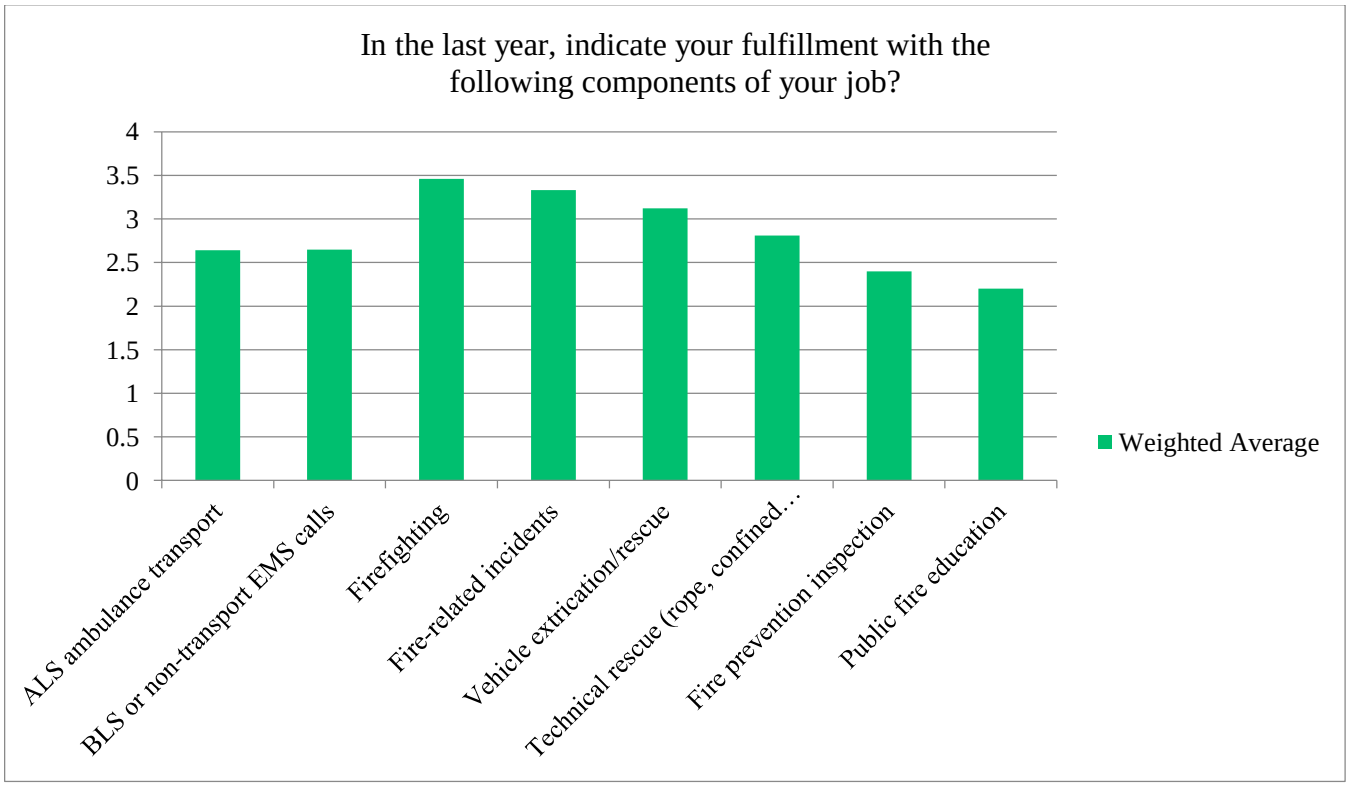


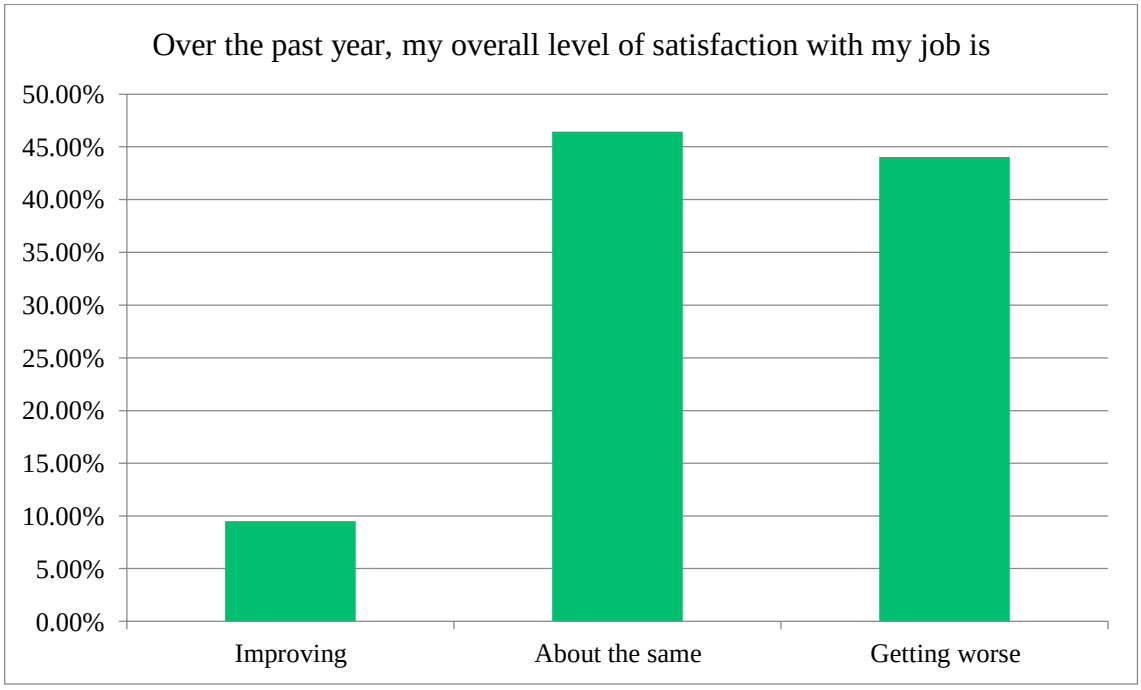
Table 8.5: Average Satisfaction with Job Components

In the last year, indicate your fulfillment with the following components of your job?												
	Highly Satisfied		Somewhat Satisfied		Neither Satisfied or Dissatisfied		Somewhat Dissatisfied		Highly Dissatisfied		N/A	
ALS ambulance transport	8.33%	7	20.24%	17	20.24%	17	17.86%	15	26.19%	22	7.14%	6
BLS or non-transport EMS calls	8.33%	7	17.86%	15	29.76%	25	13.10%	11	27.38%	23	3.57%	3
Firefighting	21.69%	18	38.55%	32	12.05%	10	10.84%	9	13.25%	11	3.61%	3
Fire-related incidents	13.10%	11	41.67%	35	16.67%	14	14.29%	12	10.71%	9	3.57%	3
Vehicle extrication/rescue	8.33%	7	27.38%	23	34.52%	29	9.52%	8	11.90%	10	8.33%	7
Technical rescue (rope, confined space, etc.)	5.95%	5	19.05%	16	29.76%	25	21.43%	18	13.10%	11	10.71%	9
Fire prevention inspection	3.61%	3	13.25%	11	28.92%	24	10.84%	9	31.33%	26	12.05%	10
Public fire education	3.57%	3	2.38%	2	30.95%	26	16.67%	14	29.76%	25	16.67%	14

Detailed response information is shown in Table 8.5. Notably, 12-17 percent of responses in regard to fire prevention activities were marked as “N/A”, reflecting the limited involvement by most personnel in these activities.

The next satisfaction question (Figure 8.17) asked if the overall level of job satisfaction was changing. Member responses indicated that nearly half of members felt that their overall job satisfaction was either “about the same” of “getting worse.” Over nine percent (eight members) felt that their job satisfaction was improving over the past year. Keeping in mind that job satisfaction in the fire/EMS service is generally high, the share of those saying it is getting worse is still notable.

Figure 8.17: Overall Job Satisfaction Trends



To gain further insight into job satisfaction, we asked about compensation and benefits (Table 8.6). The greatest percentage of satisfied responses were for overtime/schedule and pension/retirement, tied at 36 percent. Emergency incident workload was lowest, with only 13 percent selecting any form of “satisfied.” Pay was the second lowest level of satisfaction, at 15 percent. Medical and mental health support achieved 20 percent satisfaction.

Table 8.6: Satisfaction with Pay, Benefits, Conditions

Category	Highly Satisfied	Satisfied	Neither Satisfied or Dissatisfied	Dissatisfied	Highly Dissatisfied
Pay	2%	13%	16%	38%	32%
Overtime/Schedule	6%	30%	40%	16%	8%
Emergency Incident Workload	2%	11%	26%	39%	21%
Retirement or pension plan	10%	26%	23%	23%	19%
Medical and mental health support	5%	15%	35%	24%	21%

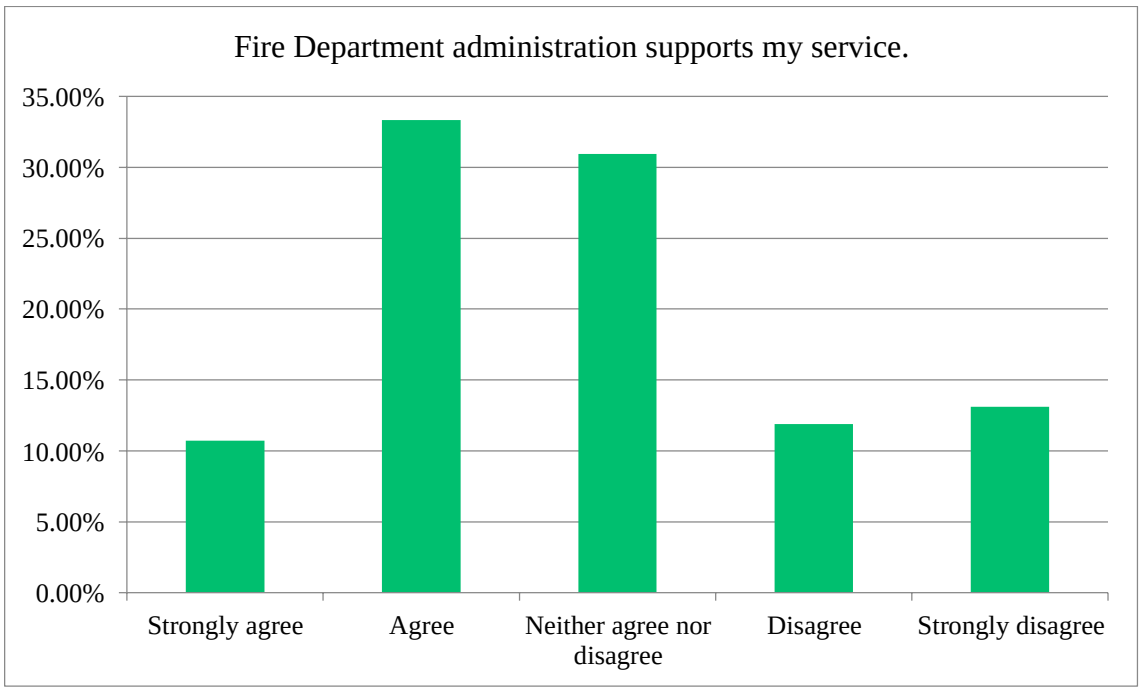
Support for The Job

In the next series of questions, members were asked their perceptions of how they feel supported by various constituencies.

We first asked members how they rated support received from the Department Administration (Chiefs, command, and administrative staff).

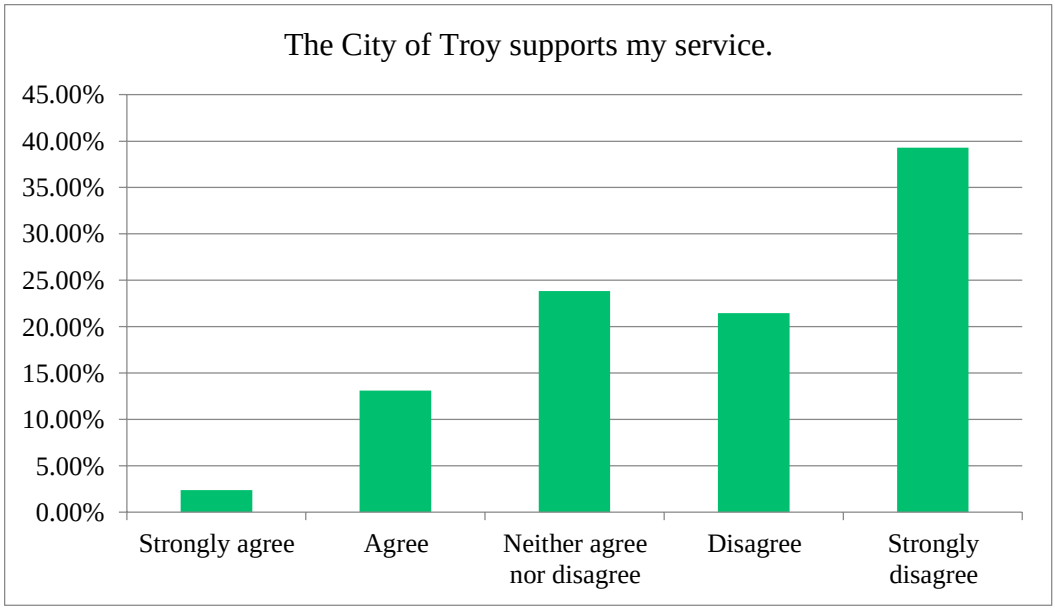
Forty-three percent of respondents indicated that they agreed or strongly agreed that “fire department administration supports my service.” Thirty percent were neutral, and the remaining 25 percent either disagreed or strongly disagreed. The dominant categories were neutral to agree.

Figure 8.18: Department Administration Supports My Service



The next question asked if the City of Troy (municipal administration) supported my service. In this case, members were much more negative, indicating that about 60 percent disagreed or strongly disagreed with the statement. While about a quarter of members were neutral on this question, about 15 percent indicated that they agreed or strongly agreed that city administration supported their service.

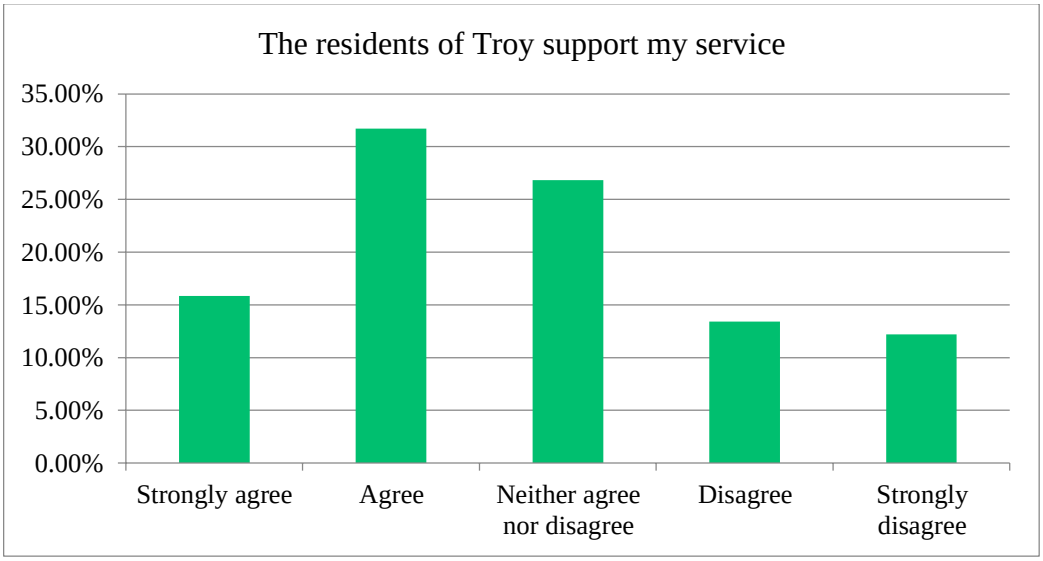
Figure 8.19: City of Troy Supports My Service



The final question in this series asked if "residents of Troy support my service?" The members surveyed felt most positive about public support, with 46 percent agreeing or strongly agreeing with that statement. Over a quarter were neutral, and a similar percentage either disagreed or agreed.

This pattern of perceived support is not uncommon in other departments, with the public viewed as most supportive, followed by the department administration, and then the city administration.

Figure 8.20: Residents of Troy Support My Service



Open-Ended Comments

The survey ended with an opportunity to make comments. There were no limits on what could be posted, and response was optional. We received 49 comments from personnel taking the survey.

We performed a thematic analysis on the comments and coded them as follows in Table 8.7. Some people listed multiple items in their response. We assumed that items listed first were top priorities. The table shows first priorities and total comments along various themes.

Table 8.7: Open-Ended Survey Responses Summary

First Issue	Number of References	Second/Other Issue	Total References
Inadequate Staffing	26	Inadequate staffing	34
EMS and fire workload/too many hours on duty	6	EMS and fire Workload	11
Inadequate training	4	Inadequate training	11
Optimism with new leadership	3	Poor upkeep of facilities	3
Pessimism	2	More pay	3
		Abuse of personnel by public on EMS calls	2
More pay	1	Payroll system	2

Staffing was far and away the biggest concern, which included various dimensions of general need for more staff and specific calls for added staff on ambulances or ladder companies. The

practice of cross-staffing ambulances with fire companies was specifically mentioned by several comments. Overall, staffing concerns were mentioned by 69 percent of those leaving comments.

Several of these comments specifically raised concerns about safety, and the impacts of having fire units out of service when staff are assigned to ambulances as well as 2-person ladder companies. Compliance with NFPA 1710 was mentioned in several comments.

The second most common comment related to high or excess workload, which is an indirect function of staffing. These comments were raised as a first priority for six people, and for 11 personnel in total. One person specifically noted that overtime shifts on the ambulance were too taxing.

The next most common concern was various expressions that training was inadequate, primarily due to personnel being unable to participate due to calls for service while they were working, and the inability to get multiple units together to simulate more complex operations. Concern was also raised about the quality of EMS training, with a reliance on online training. Training is often not a high-level concern, so the prominence of this topic is notable.

Mental health and wellness were raised by two members directly, while others noted the strains of excess overtime shifts.

Other items mentioned included poor pay in comparison with other jurisdictions that do not deliver EMS, the need for mental health/wellness support, abuse of EMS personnel by the public, poor upkeep of fire stations, and long wait time for ambulances to transfer patients at hospital emergency rooms.

The following item raised only one comment -- staffing levels for administration.

Commentary on Member Survey

The members survey results highlight several issues. Some context is necessary, as the relations between the city and firefighter's union have recently been contentious. The labor agreement is currently being negotiated, influencing some of the results.

Issues of staffing and workload are at the forefront of the findings. These are borne out by the analysis in our report. Concerns over health and wellness and safety on the job were also raised, indicating that existing programs could be strengthened or realigned to improve their efficacy for the membership.

Interestingly, overtime emerged quickly as a high-level concern when speaking with members, but the survey indicated that while there was concern with excess overtime, members did not indicate that they were being forced to work overtime and indicated a willingness and availability to take on some additional hours.

The TFD was in the midst of a historic staffing shortage, and an unprecedented number of new employees should be coming out of training and onto shift in the coming months. This should

reduce the overtime demands and hopefully improve the on-duty staffing as more employees are available.

Members expressed a concern that more training is needed, including more hands-on training. This is a positive sign and the report contained several recommendations in this regard. Many of these concerns can be traced to limited resources and the inability to find time to train with the emergency response workloads.

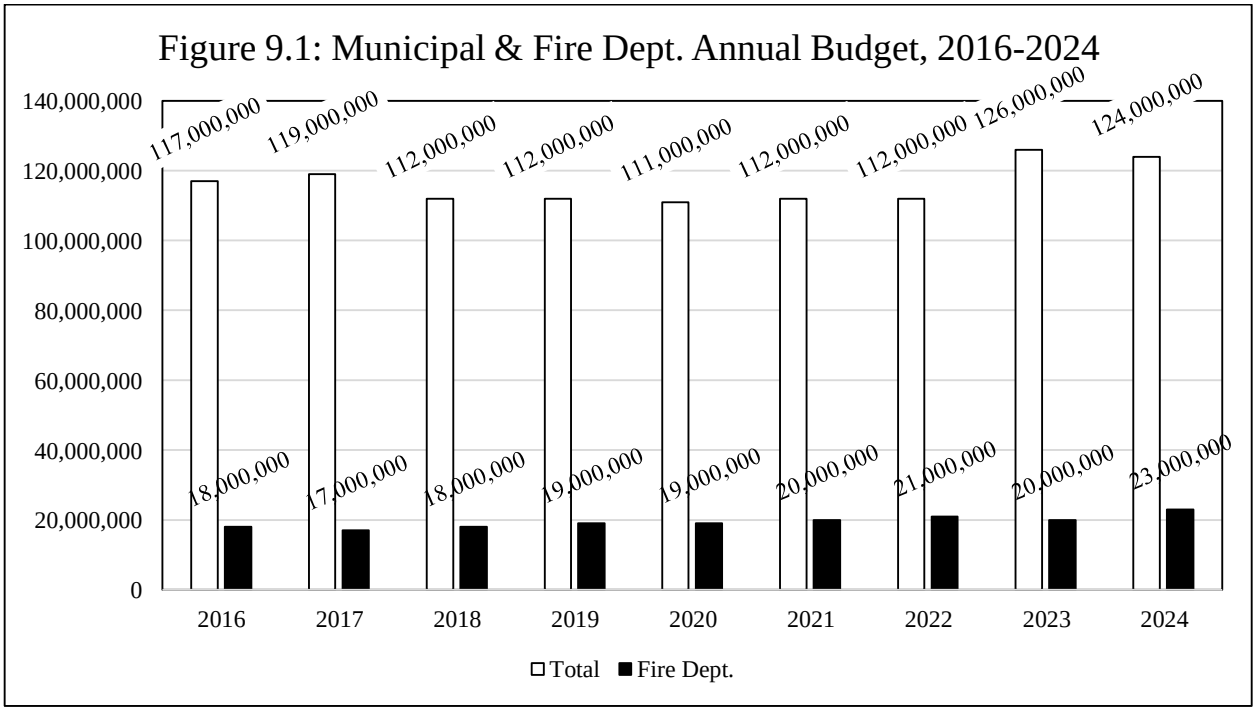
Maintenance concerns are also well-known, and our discussions with both leadership and membership indicate acknowledgment of improvement.

The pattern of members feeling supported by the Department, public, and city follow well-established patterns common to fire departments of many types.

9. FISCAL ANALYSIS

This section provides an overview of the Bureau's budget between the years 2016 and 2024. The section includes a general overview of the budget with focus on operations, overtime, and capital improvement expenditures. A review of revenues generated through EMS billing is also addressed.

The city operates through the generation of revenue collected through various local taxes and fees, along with outside state and federal support. The TFD's budget is supported through these funding venues as well as through charges for EMS service and various grant programs. Figure 9.1 below provides a review of the city's annual budget for the years 2016-2024. Included is a comparison of the TFD's annual operating budget. The figure indicates that in the year 2024, eighteen percent of the city's budget was allocated to the TFD's operations, with the average over the nine-year span being 16.47 percent.

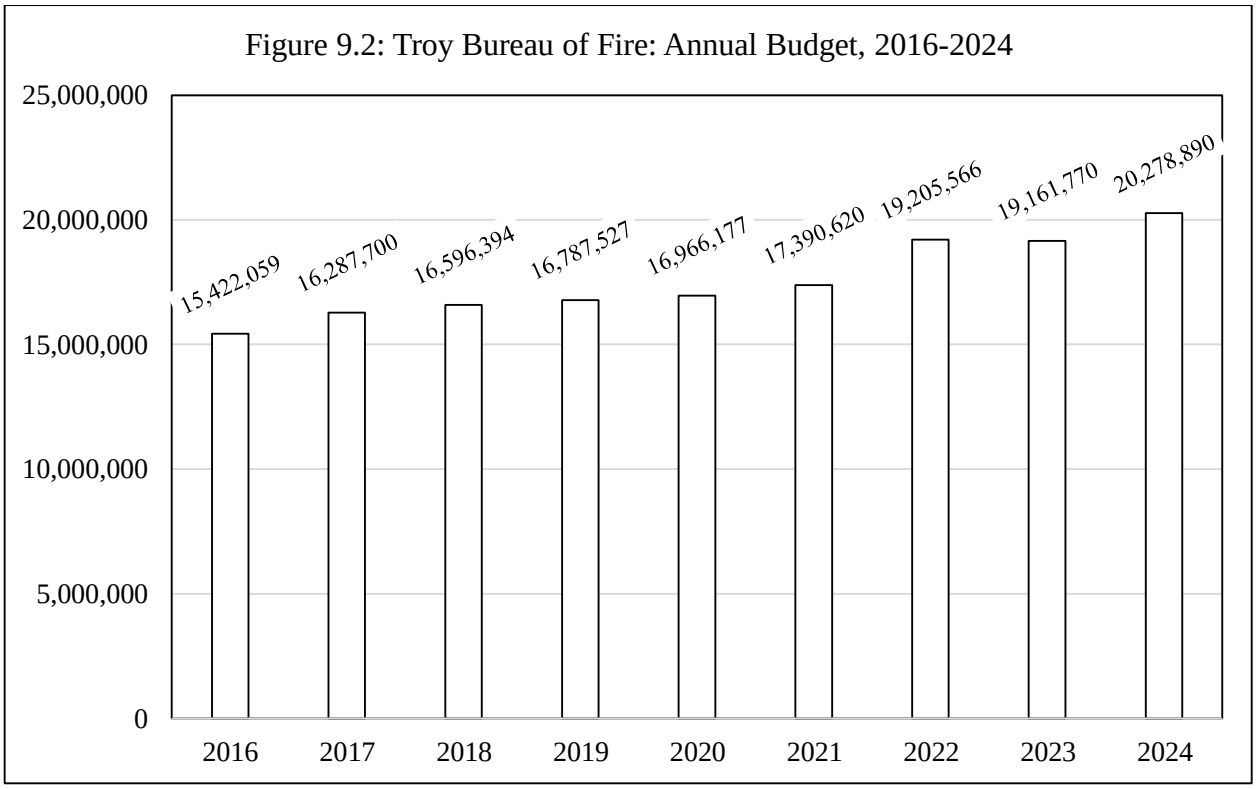


History of Fire Bureau Budget

Figure 9.2 below includes the Bureau's total approved operating budget for the years 2016-2024. The budget includes salaries and benefits, equipment and operating supplies, and overtime. The Figure indicates the budget has steadily increased over the nine-year period, from just over 15 million in 2016 to 20 million for the current year. During this period, the budget increased

roughly twenty-four percent. In more recent years, 2020-2024, the budget increased by approximately seventeen percent.

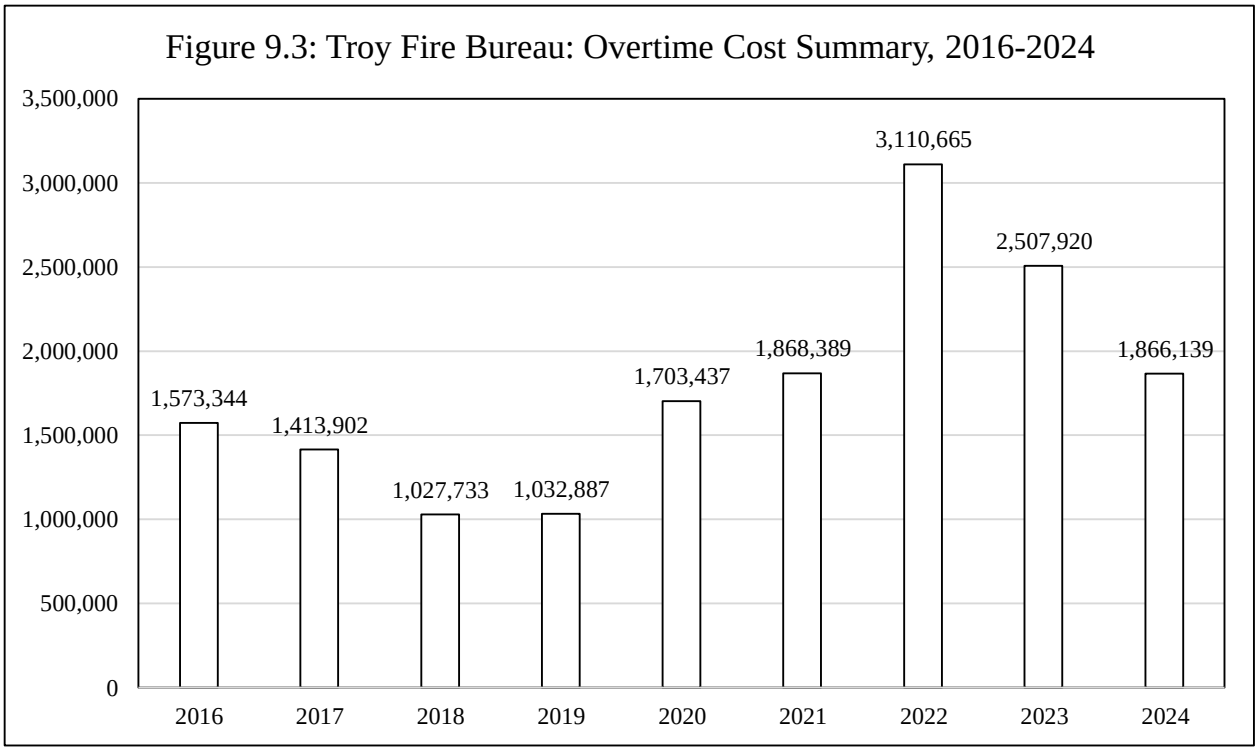
Figure 9.2: Troy Bureau of Fire: Annual Budget, 2016-2024



Overtime Analysis

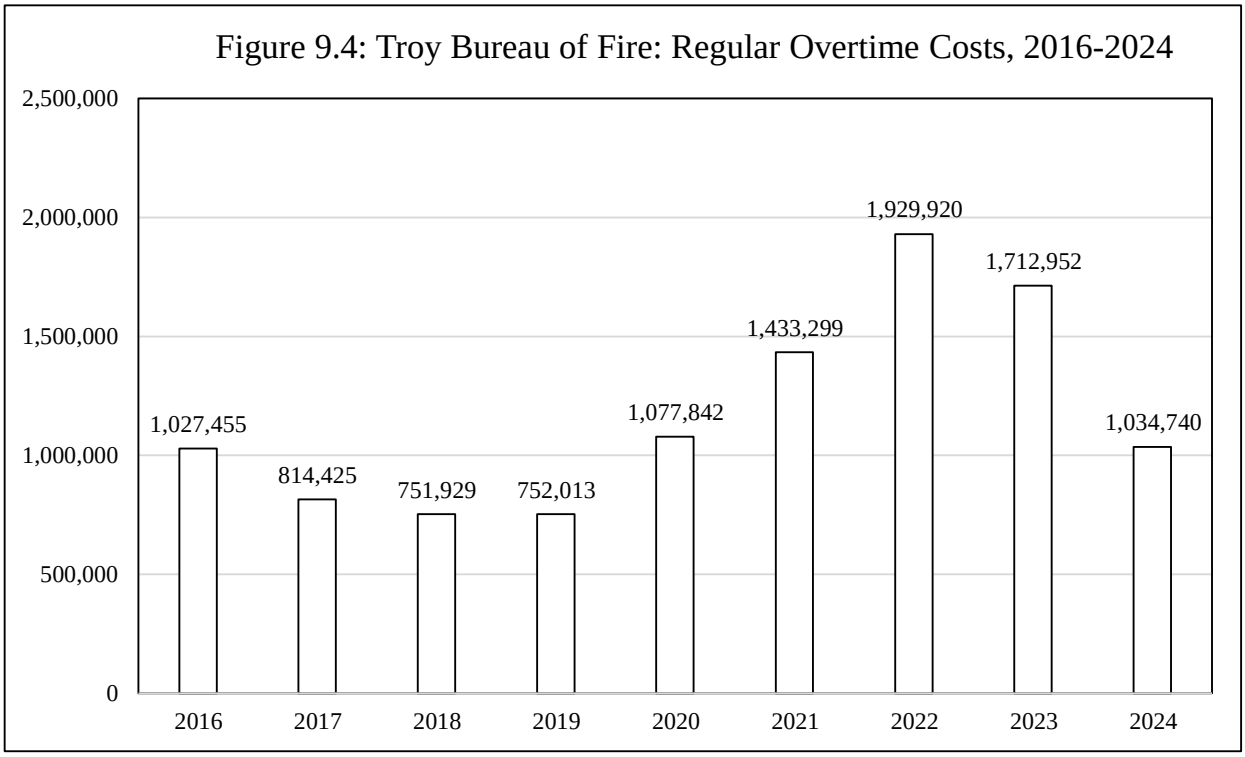
9.2.1. Overtime Budget Detail

Figure 9.3 below illustrates total overtime costs from 2016 to 2024. Overtime costs decreased by nearly thirty-five percent from 2016 to 2018. Costs began to rise sharply in 2020, reaching a peak of $3,110,665 in 2022, an increase from the low in 2018 of over two-hundred percent. Since 2022, overtime costs have decreased from the peak by forty percent.



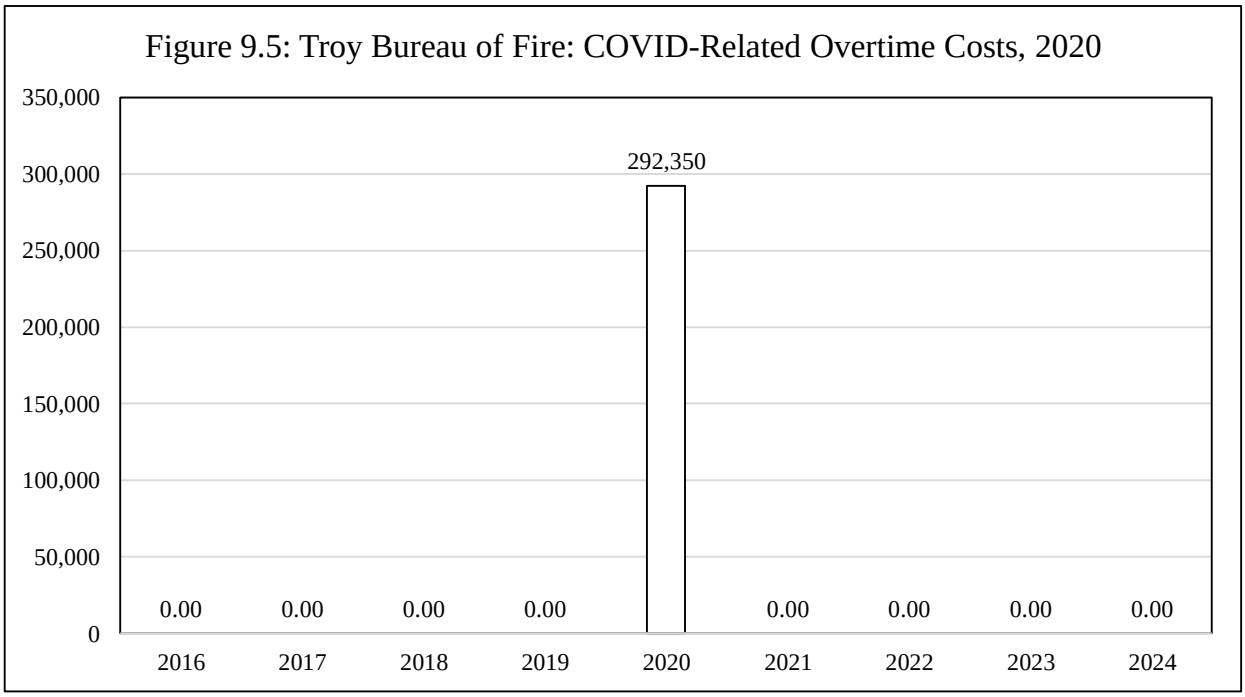
Regular Overtime

Figure 9.4 below shows regular overtime expenditures for the years 2016 to 2024. This figure predictably mirrors the pattern in Figure 9.3. Regular overtime costs decreased from 2016 through 2019, only to begin rising steadily in 2020 with a peak in 2022. Regular overtime costs fell slightly in 2023 and more precipitously in 2024. From trough to peak, which includes the years 2018 and 2022, regular overtime costs increased by 157 percent. From the peak in 2022 to the present, costs have decreased by forty-six percent.



Overtime Specific to COVID-related Grants

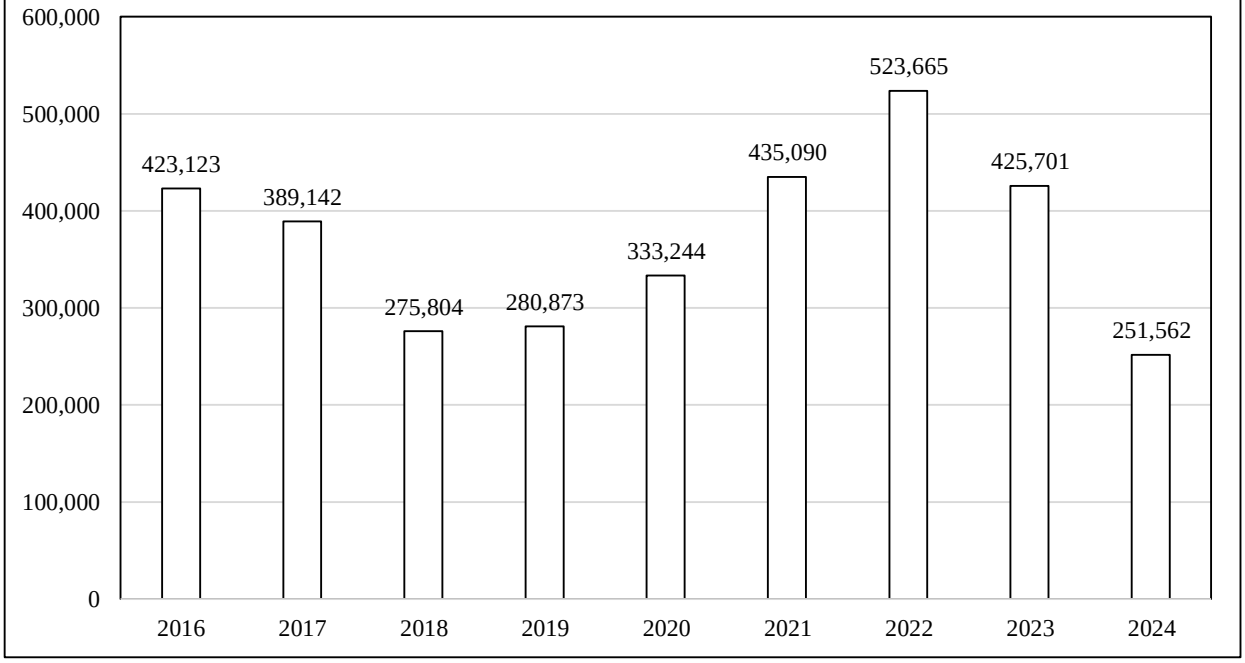
Figure 9.5 below shows 2020 as being the only year whereby overtime was paid via grants issued in response to the COVID pandemic.



Minimum Staffing (Safety Staffing) Overtime

According to Figure 9.6 below, minimum staffing overtime cost averages were highest from 2021 to 2023, with an average of approximately $461,000 annually for those years. For the years 2018 to 2020, minimum staffing overtime costs averaged approximately $297,000 annually, which is thirty-four percent lower than the 2021 to 2023 timeframe. The 2016-2017 minimum staffing costs fell between the aforementioned upper bound and lower bound averages. Data for 2024, however, show a sharp decrease with actual costs equal to roughly $252,000.

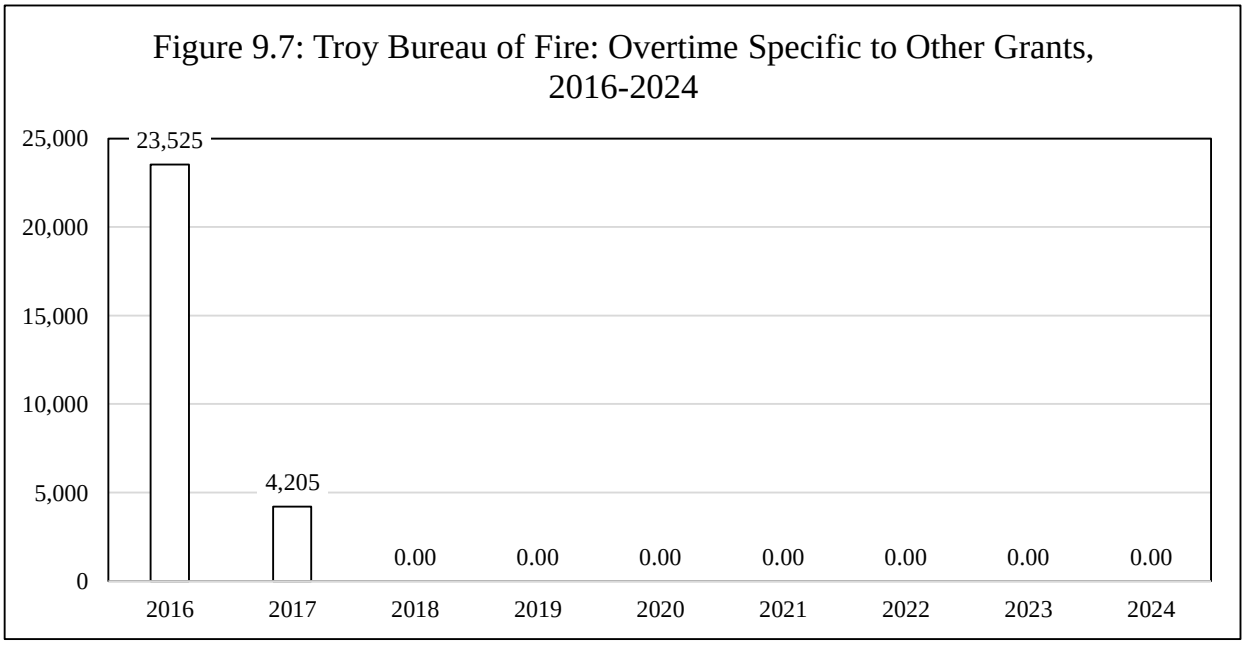
Figure 9.6: Troy Bureau of Fire: Min. Staffing (Safety) Overtime, 2016-2024



X

Overtime U.S. Department of Homeland Security Grant

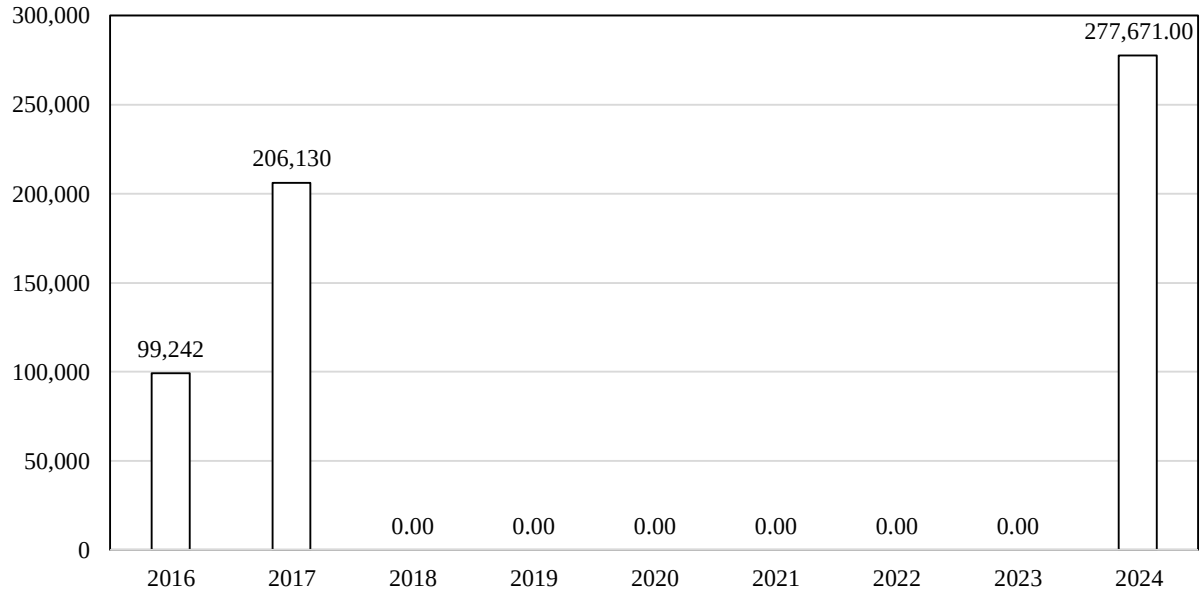
Figure 9.7 indicates that no Homeland Security Grants have been awarded to fund overtime expenditures since 2017.



Assistance to Firefighter (AFG) Peak Ambulance Overtime Exceeding Appropriation

According to Figure 9.8, overtime AFG peak ambulance overtime is nearly $278,000 in 2024. The years 2018 to 2023 show no AFG peak ambulance overtime expenditures, while 2016 and 2017 report approximately $99,000 and $206,000, respectively.

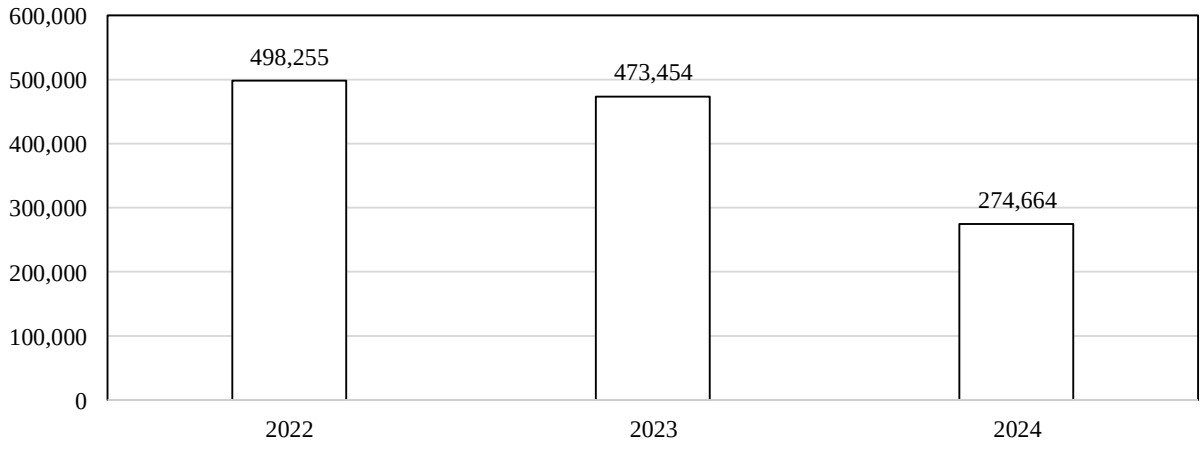
Figure 9.8: Troy Bureau of Fire: AFG Peak Ambulance Overtime, 2016-2024



Overtime Funded Through the American Rescue Plan

Figure 9.9 shows overtime funded through the American Rescue Plan averaged approximately $486,000 for years 2022 and 2023, with a decrease to $274,664 in 2024. This represents a decrease of forty-three percent.

Figure 9.9: Troy Bureau of Fire: Peak Ambulance Overtime Funded Through the American Rescue Plan, 2022-2024



Operating Budget

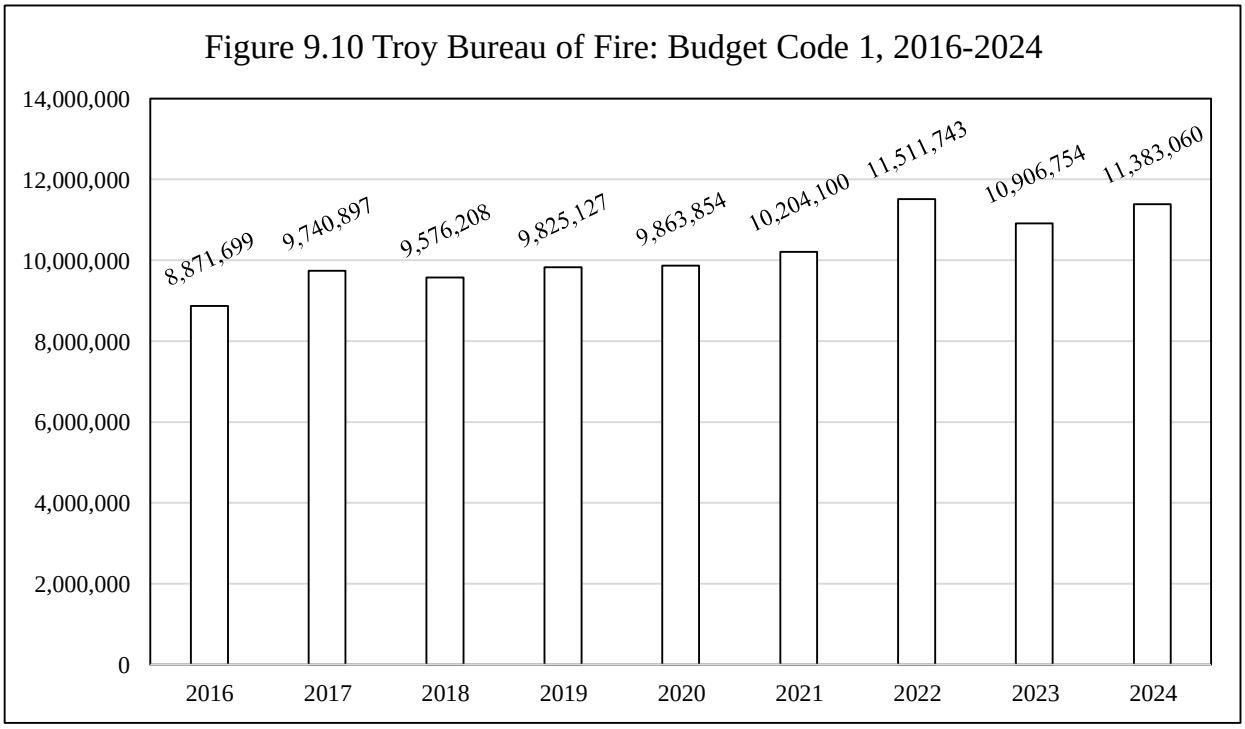
The Bureau's normal operating budget is organized into budget codes consisting of the following (Table 9.1):

Table 9.1: Troy Bureau of Fire Budget Codes

Code	Name
1	Salaries and Overtime
2	Equipment & Capital Outlay and Other Equipment
3	Office Supplies, Small Tools, Fuel, Vehicle Maintenance, and General Supplies
4	Utilities, Uniforms, Training, Medical Supplies
8	Pension & Benefits

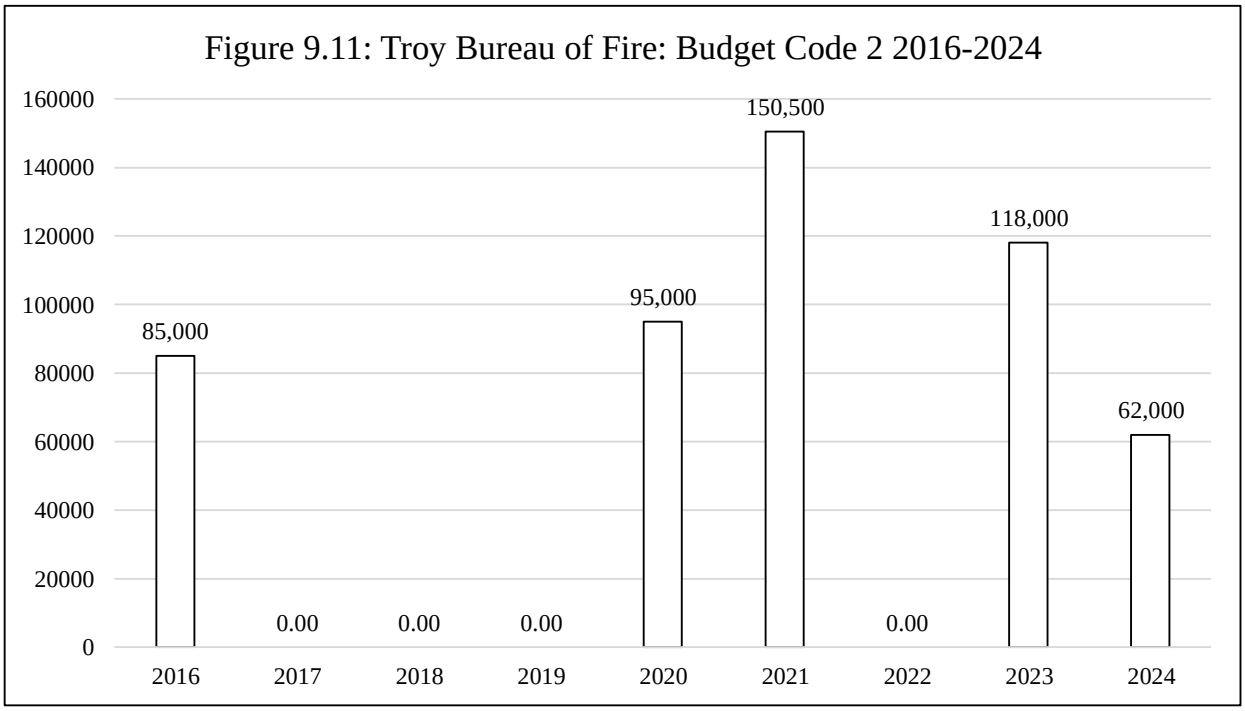
Code 1: Salaries and Overtime

Figure 9.10 shows a steady increase in salaries and overtime expenditures from 2016 to 2024. Salaries and overtime have increased approximately twenty-eight percent in that time frame. The only exception to this trend was in 2023, where costs decreased due to personnel vacancies.



Code 2: Equipment & Capital Outlay and Other Equipment

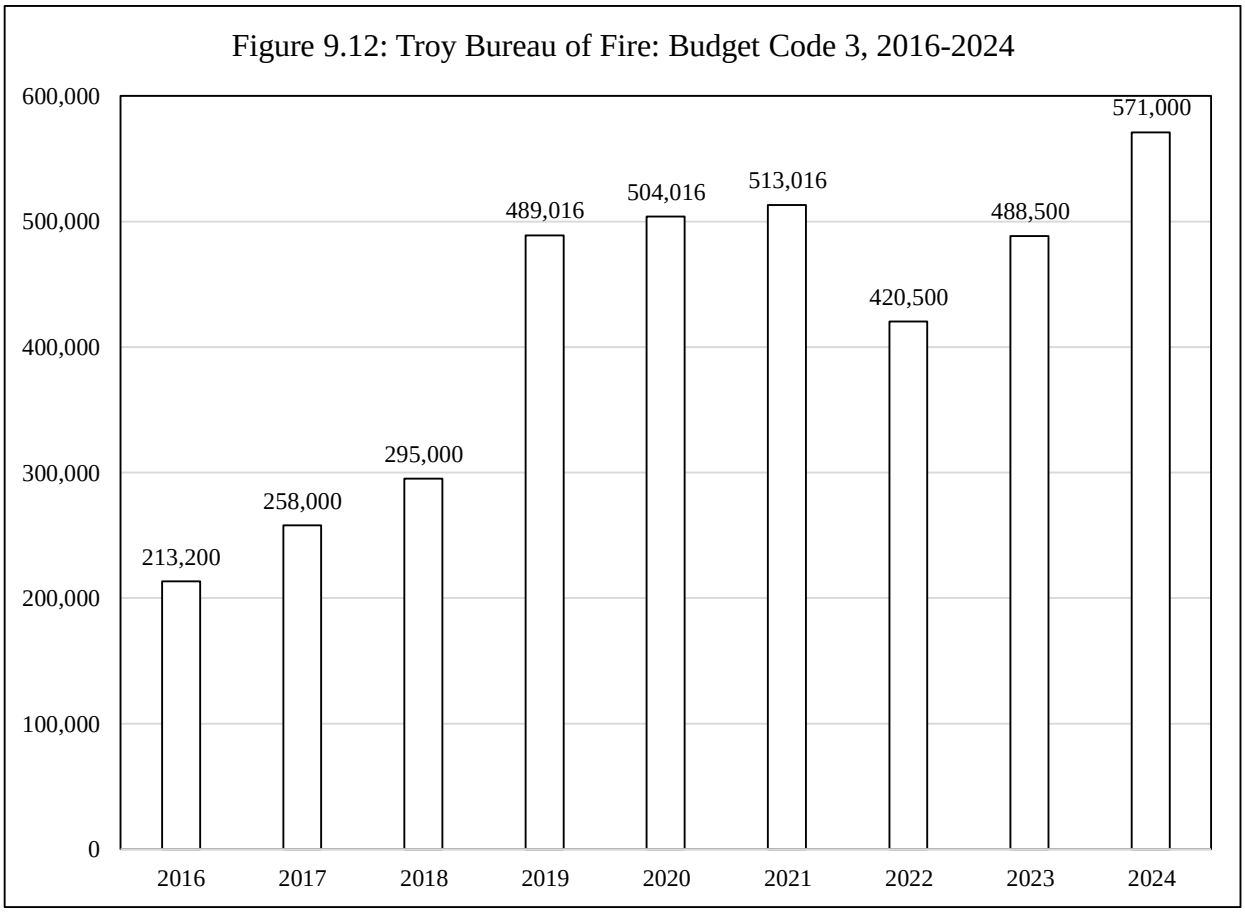
According to Figure 9.11, equipment and capital outlay and other equipment expenditures have been periodic. There were zero expenditures for years 2017 to 2019 and 2022. The highest year of such expenditures was in 2021, in the amount of $150,500.



Code 3: Office Supplies, Small Tools, Fuel, Vehicle Maintenance, and General Supplies

Figure 9.12 illustrates a significant increase in expenditures associated with office supplies, small tools, fuel, vehicle maintenance, and general supplies from 2016 to 2024. The nadir of this spending ($213,200) occurred in 2016 with a peak of $571,000 in 2024. This represents a 168 percent increase over this time period, although such costs were relatively flat from 2019 to the present.

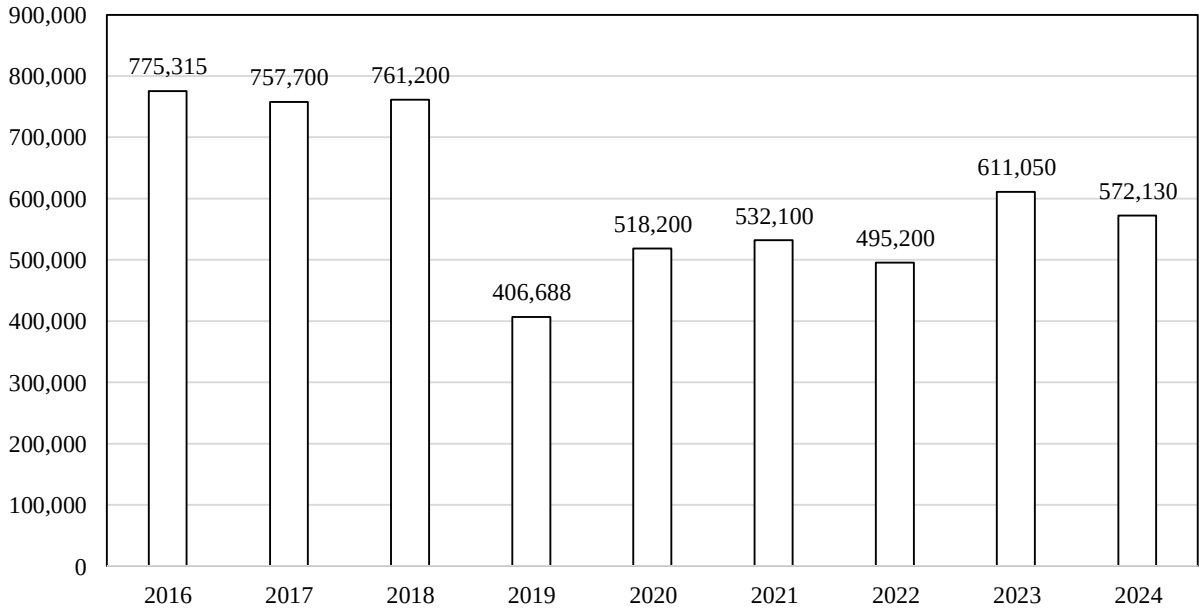
Figure 9.12: Troy Bureau of Fire: Budget Code 3, 2016-2024



Code 4: Utilities, Uniforms, Training, Medical Supplies

According to Figure 9.13, utilities, uniforms, training, and medical supply costs were highest for the years 2016 to 2018, averaging approximately $765,000. These costs have since decreased, averaging roughly $522,500 over the subsequent six years. This represents an aggregate decrease of thirty-two percent.

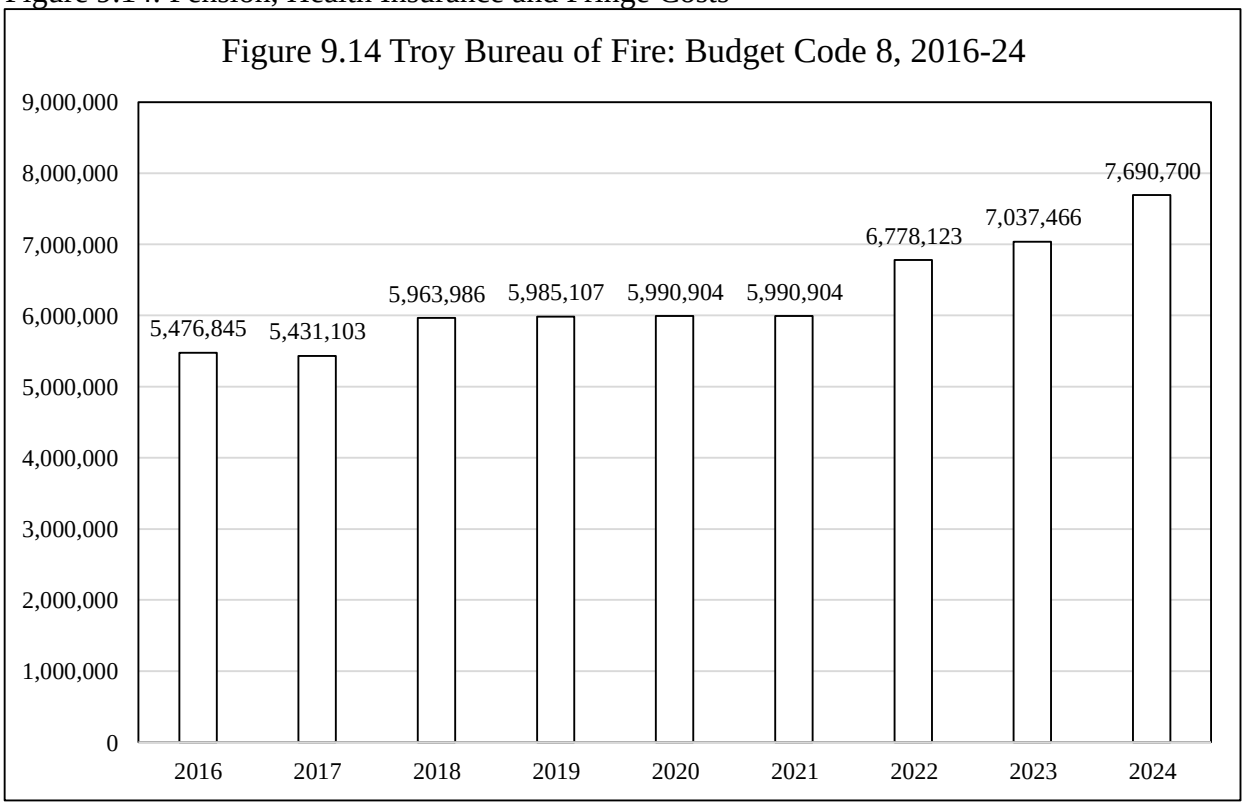
Figure 9.13: Troy Bureau of Fire: Budget Code 4, 2016-24



Code 8: Pension, Health Insurance, Social Security, Related

Costs associated with pension, health insurance, and social security benefits saw their largest year-over-year increases from 2022 to 2024, according to Figure 9.14 below. From 2021 to 2024, costs increased by twenty-eight percent. From 2016 to 2021, such costs only increased nine percent over a longer time interval.

Figure 9.14: Pension, Health Insurance and Fringe Costs



Capital Budget

Previous Capital Budget Allocations

Past capital budgeting expenditures, spanning from 2020 to 2023, averaged $1.44 million annually (Table 9.2). Future capital allocations from 2024 to 2028 are projected to be considerably higher than the previous four years, with an annual average of $3.125 million (Table 9.3). Facility upgrades represent fifty percent of future capital cost projections, while apparatus investments represent the remaining fifty percent.

Past Capital Budgeting Expenditures

Table 9.2: Troy Bureau of Fire: Previous 5-Year Capital Allocation: 2020-2023

Apparatus Type	2020	2021	2022	2023	Total
Squad Truck	-0-	-0-	-0-	-0-	
Pumper	660,000	-0-	-0-	750,000	1,410,000
Ambulance	-0-	-0-	225,000	275,000	500,000
Vehicles	-0-	-0-	1,300,000	-0-	1,300,000
Aerial Ladder Trk.	90,000	-0-	100,000	-0-	190,000
Facility Upgrades	50,000	-0-	875,000	-0-	925,000
Total for Year	800,000	-0-	2,500,000	1,025,000	4,325,000

Proposed 5-Year Capital Budget

Table 9.3: Troy Bureau of Fire: Proposed Capital Budget: 2024-2028

Apparatus Type	2024	2025	2026	2027	2028	Total
Squad Truck	-0-	-0-	800,000	800,000	-0-	1,600,000
Pumper	950,000	1,000,000	-0-	1,075,000	-0-	3,025,000
Ambulance	325,000	-0-	375,000	-0-	425,000	1,125,000
Vehicles	65,000	-0-	-0-	85,000	-0-	150,000
Aerial Ladder Trk.	-0-	-0-	1,900,000	-0-	-0-	1,900,000
Facility Upgrades	175,000	7,500,000	75,000	-0-	75,000	7,825,000
Total for Year	1,515,000	8,500,000	3,150,000	1,960,000	500,000	15,625,000

EMS Billing

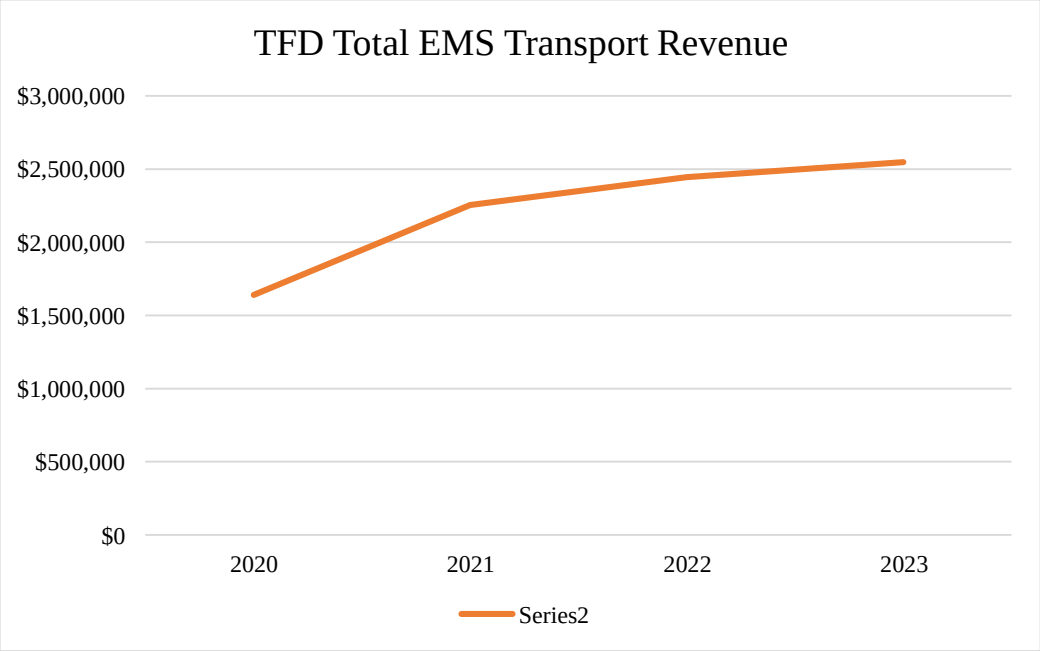
Table 9.4 summarizes EMS service and mileage fees. The Troy Fire Department uses a third-party billing service for its EMS transport billing and collections. The relationship between the city and the vendor is reported to be positive.

Table 9.4: Troy Bureau of Fire Ambulance Service Charge
(effective 1/4/21)

Service	Rate
BLS-1	$1,085.00
ALS-1	$1,875.00
ALS-2	$2,430.00
Mileage	$34.00

Figure 9.15 illustrates EMS Transport Revenue for 2020 through 2023. We can see that revenue has increased each year, with a substantial increase from 2020 to 2021. In 2023, total revenue was $2.54 million. The 2024 YTD (through August) would exceed that of 2023, assuming previous collection trends hold.

Figure 9.15: EMS Billing Revenue



An examination of billing data on an annual basis (2020-2023) is shown in Table 9.5 below. We can see that the overall collection rate increased, such that revenues in 2023 were higher than those in previous years in spite of a decline in transports from 2022 to 2023. While collection

rates for insured patients remained steady, there has been a trend toward a decreasing percentage of self-pay patients paying their bills.

Table 9.5: Summary of EMS Collection Performance

	2020	2021	2022	2023
Total Transports	4988	6685	7130	6529
Insurance	4366	5884	6281	5885
Facilities/VA	29	28	16	23
Self-Pay	643	773	833	621
Insurance Collection Rate	94.3%	93.8%	93.1%	94.2%
Facility/VA Collection Rate	100%	84.3%	100%	96.3%
Self-Pay Collection Rate	8.1%	5.7%	3.9%	4.2%
Total Collection Rate	62.3%	64.9%	63.9%	70.6%

The EMS billing charges are often in excess of what insurers will pay. Insurers typically have maximums they will reimburse regardless of the amount billed. This is referred to as the “allowable” billing. The amount collected is compared to the allowable amount to determine the efficiency of collections. Key milestones in payments are shown for 2023 (Table 9.6). A complete breakdown of EMS transport billings and revenue are included in the Appendices.

Table 9.6: City of Troy EMS Transport Billing 2023

Source	Transports	Total Charges	Total Allowable	Total Collected	Percent Collected	Percent of Revenue
Blue Cross	221	$383,253.00	$123,963.	$115,411	93.1%	4.5%
Medicaid	2,232	$3,458,839	$551,091.	$549,698	99.8%	21.6%
Medicare	2,329	$3,717,202	$1,037,396	$983,420	94.8%	38.6%
Other Insurance	1,103	$1,806,690	$912,018.86	$824,535	90.4%	32.4%
Sub-Total	5,885	9,365,985	$2,624,469	$2,473,065	94.2%	97.0%
Veterans Administration	21	$36,311	$33,909.	$33,908.58	100%	1.3%
Facilities and Providers	2	$3,334	$3,334	$1,943	58.3%	0.1%
Sub-Total	23	$39,645	$37,243	$35,852	96.3%	1.4%
100% Self-Pay – Insured	335	$511,221	$486,878	$30,396	6.2%	1.2%
100% Self-Pay – Uninsured	286	$458,860	$458,860.	$9,131	2.0%	0.4%
Sub-Total	621	$970,081	$945,739	$39,528	4.2%	1.6%
Grand Total	6,529	$10,375,711	$3,607,450	$2,548,444	70.6%	

9.5.1. Commentary on EMS Billing

Regarding collection rates: Communities are not homogenous, so that even in neighboring towns with equal populations and densities, they may have different 9-1-1 call volumes. When we begin to drill down into demographics, even when we take into account things like socio-economic status and payer mixes, even if they were all equivocal, collection rates may not be comparable. The biggest issue is the lower reimbursement for Medicaid. Note that in 2023, Medicaid allowed only $551,000 against $3.4 million in charges, versus Medicare, which paid $1,037,000 for $3.7 million in total charges.

Variation in the billing mix between communities, socio-economic status, and call volume all help explain variations. Further variation results from issues such as capping of billing rates for certain insurance carriers. Larger entities may be able to negotiate more favorable reimbursements. The ability to bill car insurance or workers compensation insurance may also result in better collections.

Comparative Fire Service Salary and Conditions Data

The fire service, like many economic sectors, is experiencing greater difficulty attracting people to the field. A combination of generational change and post-covid dynamics has had two effects: 1) fewer candidates applying; and 2) a willingness to change jobs that was formerly unheard of. The other major trend is that newer employees value work-life balance and are unwilling to work excess overtime, meaning that filling shifts when absences occur is going to be more challenging.

The TFD exists in an increasingly competitive environment, and workers today are not as willing to tolerate poor working conditions or excess work requirements. A recent concern is that the City of Albany has opened up a lateral transfer program, enabling trained firefighters to leave their departments and move to Albany, where pay or working conditions may be more desirable. Several EMS agencies in the Capital Region also offer salaries competitive with TFD, meaning that attracting these personnel is more challenging, and prospective paramedics can choose from comparatively less demanding work environments.

Data on area fire departments were collected so as to provide context and points of comparison with Troy. Key data fields include: 1) recruit salary; 2) training and certification requirements; 3) human resource requirements; 4) annual service calls; 5) operating budget; 6) total number of firefighters; 7) staffing requirements; 8) types of apparatus in service; and 9) EMS provided. Data were collected on seven fire service departments, including: Albany, Watervliet Arsenal, Watervliet, Cohoes, Saratoga Springs, Green Island, and Schenectady.

Key trends and findings include the following (see Table 9.7 below):

- Watervliet has the lowest recruit salary at $38,000 and Green Island the highest at $56,653. Troy's recruit firefighter salary falls between this range, at $40,433 annually ($42,415 at the six-month interval).

- Regarding firefighter training, six of the seven fire service departments have similar training and certification requirements. Watervliet Arsenal is the exception, requiring Firefighter I and II in addition to Hazmat training. Troy's training and certification requirements are more rigorous, mirroring those of Watervliet Arsenal, albeit without the Hazmat training requirement.
- Regarding EMS training, two fire service departments require paramedic training – Schenectady and Saratoga Springs. Albany does not require it per se but does pay its recruits an additional $2,724 for being paramedic certified. Troy has been waiving its paramedic requirement on most newly hired firefighters.
- In terms of human resource requirements, six of seven are Civil Service departments, as is Troy.
- There is a wide range in terms of service calls annually. Albany has the highest number annually at approximately 24,000. This is followed by Schenectady with 19,400. Watervliet Arsenal has the lowest number with 521 calls in 2023. Troy averages over 13,000 calls annually, which is more than double the median number of calls (4,379) for the seven comparative departments.
- Albany by far has the largest operating budget at nearly $43 million. The median operating budget for the seven departments is $4,218,290. Troy's operating budget is nearly five times the median and the second largest in comparison to the seven departments analyzed.
- The median number of firefighters is 33, while the range is 252. Troy currently maintains 119 firefighters.
- In terms of EMS, Schenectady, Saratoga Springs, Watervliet, Albany, and Troy provide ALS.

Table 9.7: Comparative Fire Service Data

Municipality	Recruit Salary	Training / Certification Requirements	Human Resource Requirements	Annual Emergency Incidents	Annual Operating Budget	Number of Firefighters	Staffing	Apparatus	EMS Services
Albany	$49,605 for firefighter/EMT; $52,329 for firefighter/ paramedic	CPAT, 229 Basic Firefighting Training Program, including Apparatus Operator Pump and Apparatus Operator Ariel; NYS EMT in good standing with NYS EMS.	Civil Service Exam; must reside in Albany County or contiguous county at the time of appointment.	24,000	$42,987,859	260	24-hour shift with four platoon system; Engine and Ladder Companies are staffed with an officer and 3 firefighters; Paramedic Companies are staffed with a Paramedic Officer and a Paramedic Firefighter. The Heavy Rescue is staffed with an Officer and 5 firefighters.	11 engines, 4 ladders, 1 heavy rescue, 3 rescues, 1 hazardous materials unit, 1 collapse unit, 1 Marine, 1 ATV, 1 Spec ops trailer, 1 foam trailer, 1 mobile air unit, 1 public safety bus, 1 trolley	BLS and ALS (through Paramedic Companies).
Watervliet Arsenal	$56,000	Firefighter I and II, Hazmat	Testing Designated Position (TDP); Maximum age restriction of 37	521	$3,239,604	27 (increasing to 33 in 2024)	Minimum of 8 personnel daily.	1 engine, 1 squirt, 1 ladder truck, 1 ambulance, 1 mini rescue, 1 hazmat truck	BLS transport with EMTs.
Watervliet	$38,000	New York State 229 hours via Utica Academy, valid EMT card.	Civil Service Exam.	3,000	$2,707,369	25	24-hour shift with four platoon system; five per shift, with one officer on duty	3 engines, 1 tower, 2 ambulances	ALS and transport
Cohoes	$45,360	New York State 229 hours via Utica Academy, valid EMT card.	Civil Service Exam; NY State Driver's License.	4,379	$4,218,290	33	24-hour shift with four platoon system; eight assigned per shift, minimum of 5 with one being an officer.	2 engines, 1 tower ladder	BLS, first response, contract for transport.

Saratoga Springs	$44,600	New York State 229 hours via Utica Academy, Paramedic license.	Civil Service Exam; NY State Driver's License.	6,996	$8,085,045	83	17 (1 Captain, 3 Lieutenants and 13 firefighter / paramedics); 24-hour shift	2 engines, 1 engine on order for delivery end of 2024, 75-foot quint, 100-foot platform ladder, 1 rescue truck, 1 brush truck, 4 ambulances.	BLS and ALS
Green Island	$56,653	EMT and NY State 229 hours.	Civil Service Exam.	750	$682,000	8	2 (rely on automatic aid and recall for incidents)	2 engines, 1 medium duty rescue.	BLS
Schenectady	$49,067	NYS Class A firefighter; NYS Paramedic Certificate; 60 college credits	Civil Service Exam; valid NYS Driver's License; residency requirement; at least 19 years of age.	19,400	$11,425,365	106	Minimum of 20 personnel.	2 platform trucks, 4 engines, 1 EMS vehicle.	BLS and ALS
Troy	$40,433; after six months, $42,415	Firefighter I & II, NYS Paramedic* *waived on most recent hiring, which requires EMT within 12 months	Civil Service Exam	13,000 +	$20,278,890	119	Four platoons of a minimum of 25 on-duty (including 1 Battalion Chief). Between 8 a.m. and 8 p.m. two additional firefighters are hired overtime to staff an additional ambulance for peak demand time.	Staffed: 5 engines, 1 rescue engine, 2 ladder trucks, and 4 medic units (ambulances)	Provide paramedic ALS service.

Figure 9.15: Recruitment Ad for Moreau EMS

College Fees for Fire Services

The City of Troy is home to several educational institutions – Rensselaer Polytechnic Institute (RPI), Russell Sage College, and Hudson Valley Community College. These institutions are tax-exempt as educational institutions. They attract students, provide employment, and add immeasurably to the richness of the city. However, they do place demands on fire and EMS resources paid for by taxpayers. These burdens are not trivial, as their campuses can contain laboratories, dormitories, and other structures and uses that drive calls for service.

As part of this study, we surveyed other New York municipalities to identify those that received regular payments to provide services. In most cases, these agreements may not specifically mention fire services, but are intended to support (in some measure) the costs of providing services, which include fire, ambulance, and police services.

The issue of charging fees to non-profit colleges and universities for municipal fire services emerged with Ithaca College (IC) in 2016. At this time, there were discussions by the municipality about removing IC from its fire service district, the legality of which is questionable under New York state law, according to critics of this potential approach. IC comprises 20-25 percent of all fire service calls, and therefore proponents argue there is justification for charging heavy use non-profits for the resources they consume. IC entered into a PILOT (Payment In Lieu of Taxes) agreement whereby IC provides a voluntary fire tax levy of ~ $113,000 on the Circle Apartments, which is a private apartment complex acquired by IC in 2010 for student housing. There have been no recent developments reported in the media and the figures quoted are from 2016.

In October 2023, Senator John Mannion secured a $300,000 one-time SUNY Impact Aid for the Oswego volunteer fire department to offset fire resources used by the SUNY Campus. The town has approximately 7,500 residents, but there are approximately 7,000 students. This places an added burden on fire services, according to Oswego Fire officials. Fire service calls have increased 104 percent in the last two years despite only a 12 percent increase in Oswego's resident population. Approximately 40 percent of the roughly 900 service calls are on the SUNY campus.

In August 2023, there were discussions between the University of Rochester and the city regarding a PILOT program to offset university fire services costs. The argument is that the university has assessed land values of $560 million, which would generate roughly $19 million in property tax revenue. The university pays property taxes on only parking facilities and office buildings. No terms or dollar figures have been made public as of yet.

Rochester Institute of Technology (RIT) provides an annual donation of $45,000 (2020 figure) to the Henrietta Fire District. In 2019, RIT did offset the cost of a $1.3 million ladder truck. The precise amount was not disclosed.

Cornell and Syracuse Universities have entered into general fund PILOT programs[15]. Cornell, as of October 2023, drafted a new 21-year agreement to voluntarily pay $4 million annually to the city. Syracuse University, in January 2022, approved a five-year agreement to pay the city a total of $11 million over five years. In both cases, the funds are not earmarked for specific services.

Payments to Rensselaer County

The City of Troy makes an annual payment of $1 million to Rensselaer County to pay for the cost of dispatching services for police and fire/EMS services. We understand that this agreement is due for renewal. We would suggest that the city consider the following in their discussions:

[15] There was speculation that Syracuse University charged its students a fee so as to provide a direct subsidy to the Syracuse fire department. According to sources within the university's Comptroller's Office and the Department of Public Safety, this is not a current practice of Syracuse University.

Offset the payment with greater support for the city's hazardous materials team, which services the entire county. Beyond incidental equipment and supplies, the county should support the cost of maintaining a cadre of trained personnel so that overtime costs associated with backfill, or direct costs of participating in training, can be paid by the county. The maintenance of staffing on a 24/7 basis requires ongoing training, which is a challenge for TFD, given their limited overtime budget. The TFD estimates that the annual cost of training in hazardous materials for its cadre of staff (including backfill) is approximately $110,000 annually, for example.

Another option for collaboration would be to consider reducing the amount due to the county to offset a crew for an additional on-duty ambulance that could serve as a surge unit for the county when not busy within the city.

10. RECOMMENDATIONS AND ALTERNATE ORGANIZATIONAL MODELS

This chapter presents a discussion of our recommendations and alternatives as a result of the analysis presented in this report. We distinguish between hard recommendations, written as such, and items for consideration, which we acknowledge are decisions that are not purely technical in nature.

We make the following recommendations sensitive to the fiscal context of the city, and understand the difficulties in making all the investments necessary to strengthen the delivery of services to the citizens.

The Troy Fire Department is under-resourced in almost every aspect of its operations. Administration is gutted, with two full-time Chief Officers managing multiple roles. Other key positions and functions are being fulfilled by line officers on a part-time, overtime-funded basis. The management capacity is stretched on a daily basis, and the Department faces numerous large, strategic challenges that must be managed alongside day-to-day activities.

The Department has virtually no proactive fire prevention activity beyond code compliance and plan review. The vacant building program appears to be effective, but is managed as one of many duties of the Deputy Chief position.

The growth in demand for service has taxed the cross-staffed units as EMS responses have increased dramatically in recent years. These increased call volumes have led to cross-staffed units being increasingly unavailable for fire-related duties. Existing staffing of three personnel per engine company is minimal, while two-person staffing on ladder companies severely limits their effectiveness.

10.1. Department's Future Role in EMS

One of our tasks was to take a strategic look at EMS service delivery and evaluate the efficacy of the current model within the city. There are also several organizational alternatives explored.

There are a number of EMS delivery models utilized across the country and within the state of New York. Nationally, almost half of all EMS ambulance systems are fire service-based. Most systems fall within two major categories, consisting of the public and private sectors. Within the public sector category there are several models, each with their advantages and disadvantages in delivering effective service. These include municipal fire service-based, non-fire service-based, separate agency, and law enforcement-based. Private sector category services include private for-profit, private non-profit, and hospital-based.

At the time of the city's merger of EMS into the Bureau of the Fire Department, emergency medical call volume was manageable. However, since then the demand for this service has reached a pivotal point where it may be just a matter of time before the Bureau experiences an incident where a sufficient number of units are not available to respond to a serious fire, response times become constantly excess, the city has reached the breaking point of not being able to adequately fund overtime, or an excessive number of officers and firefighters reach burnout.

Given these challenges, the city administration should consider the following options for the future delivery of emergency medical services:

Fire-Based Services

1. *Retain Current Fire Service-Based EMS System.* The service would remain status quo with EMS being delivered with three on-duty medic units, and one fully staffed and two cross staffed by fire units. The three units would remain supplemented during peak demand times by an additional unit, staffed by off-duty personnel with overtime pay. Fire units would continue to augment medic units by simultaneous dispatch to medical related calls. This option may not address the emergent issues of firefighter-medic burnout, escalating overtime costs, and an inadequate response force to quickly respond to reported structure fires and rescues. The emergent issues listed, including the excessive use of the system by repeat users, may be minimized by the Bureau by revising response policies. Alternative transport and referral models are an option that can be explored but, to exercise a word of caution, you need to have an alternative facility to refer someone to. These revisions have the potential to reduce overall demand for service while increasing morale and productivity. The county's adverse experience with implementing such a model suggests this may be unlikely to succeed at the city level.

2. *Hire EMS-only Fire Department Employees.* In single role fire department-based EMS systems, ambulances are staffed by fire department personnel who may not serve as firefighters as well. EMS personnel may be civilian employees of the fire department with a separate career ladder for advancement. EMS personnel may respond to fires and similar emergencies, but do not engage in duties beyond their role as emergency medical technician or paramedic. In the event of a call for a medical-related emergency, the nearest engine or ladder truck unit is often assigned to the initial dispatch along with an ambulance. This is done to ensure medical treatment is met within prescribed response time benchmarks and to augment the services of the two-person ambulance crew. This model works most effectively in cities and towns where there exists a high EMS and/or fire-related call volume, where on-duty resources are often stretched thin.

Government Third Service

3. *Establish Separate Municipal EMS Agency*. Several municipalities have, for many years, operated a separate agency whose sole role is delivering emergency medical services. Generally, salaries in these agencies are different than those found in fire service-based agencies. An advantage can be more flexibility in recruitment and retention of EMTs and

paramedics. In addition, there would be increased flexibility in developing a service staffing model without any labor encumbrances. Part-time and per-diem staff could be hired to staff a new agency, without any logjams from current contracts, helping to reduce costs.

4. *Explore Formation of Service into Separate County-Based EMS System*. In cooperation with county government, the service may be delivered through a consolidated system where the shared costs of providing the service are prorated, based on population and/or area served or similar criteria. This model would be able to capitalize on greater economies of scale for purchasing, recruitment, and training.

Private EMS

5. *Contract for Services with Private EMS Provider*. A very common method of EMS delivery is through an annual contract for services with a non-government for-profit provider. The city would delegate a third party, on its behalf, usually a for-profit service. The municipality and the provider would enter into a formal agreement for a period of time for a set annual fee or similar financial arrangement. A rigorous set of performance standards would be essential in order to protect the municipality's interests and reduce liability.

6. *Augment Current Service with Private EMS Provider*. Augment the current fire service-based EMS system with a private provider. The combination system would retain two full-time fire service medic units, augmented by private service during peak demand times and other periods of call volume. In this scenario, contract development that included performance standards would be essential in order to adequately service the municipality, while protecting their interests and minimizing liability.

Table 10.1: Ambulance Service Delivery Model Summary

	Direct Government Oversight	Use of Fire Dept. Personnel [b]	Use of Fire Dept. Facilities
Public Sector Models			
Fire Service Based			
Fire and EMS Dual Role Staffing	✓	✓	✓
Separate Role Staffing	✓	✓	✓
Combination Cross and Single Role Staffing (Current)	✓	✓	✓
Non-Fire Service-Based Service			
Separate EMS Agency	✓		
Law Enforcement-Based Service	✓		
Private Sector Models			
For-Profit Private Service			
Non-Profit Private Service			
Hospital-Based Service			

[b] Fire department personnel may provide first responder service by the dispatch of the closest fire unit to the medical emergency.

We also explored law enforcement-based and private non-profit EMS delivery but did not feel they were viable models in the City of Troy.

Commentary on EMS Alternatives

The delivery of EMS is in turmoil nationally. Within New York State, municipalities are bringing services formerly provided by private entities into fire-based or public entities. These concerns are usually driven by service level issues, rather than cost, per se. Kingston recently took over EMS delivery within the fire department. Meanwhile, Buffalo is considering moving away from its private provider. In suburban and rural areas, volunteer EMS provision was long-ago supported by legions of *per diem* employees, who often work for other agencies and cobble together a living wage from multiple jobs. As the organizational and managerial challenges of service delivery mount, ambulance service providers end up closing, merging and, in some cases, implementing regionalization or public delivery of service with full-time employees as the last resort.

In our analysis, from a cost and managerial capacity standpoint, several of these options create challenges or do not address fundamental issues facing the city. If a non-fire-based EMS alternative is considered, we do not anticipate any real savings on fire services costs, meaning that expenses would be in addition to current expenditures.

We believe that the two most feasible alternatives are to a) augment current cross-trained fire/EMS staff to accommodate increased demand, and b) jointly strengthen both fire and EMS delivery. Our priority would be to hire staff to enable the dedicated staffing of Medic 1 as a first priority.

In the near-term, we believe that the city could augment EMS delivery with a private, BLS-level ambulance available to serve the city. A high proportion of EMS calls for service are non-ALS, and the availability of this unit would reduce workload on existing Medic Units, reduce the number of low-acuity transports for city Medic Units, and keep cross-staffed fire units in service more frequently.

An alternative to this plan would be to create EMS-only employees of the TFD, but given that they were staffing only one unit, maintaining a roster would require backfill by existing dual-role firefighters, and this would be an added management challenge.

Expand Role of Medical Director

The current configuration of the Medical Director role is somewhat limited. We propose this position be expanded to enable a fuller range of duties and deeper engagement in operations.

The medical director should help identify, define, refine and, in some cases, develop mechanisms for quality assurance to include prospective and concurrent mechanisms for assessment. Some of these quality indicators may already exist, but are unrealized or unmonitored. The development

of a comprehensive quality assurance and improvement plan would be essential to the department, and identifying and developing mechanisms for concurrent and prospective quality assurance and quality improvement are crucial. The medical director should lead that effort.

The medical director should also assist the fire chief with developing and identifying the key performance indicators and benchmarks that demonstrate success in the department. Some of this already exists; for example, determining the EMS response time 90 percent of the time. This number is already available and would be a good place to stake a claim. Any changes that would be made in the future, such as subcontracting service, would need those benchmarks for contract development. The late Max Weill, MD, said, “if you didn’t measure it, it never happened.” "Performing CPR without measuring the effects is like flying an airplane without an altimeter." Troy FD provides EMS; they should be able to qualify and quantify to the citizens and elected officials in the community exactly what it is they do.

The medical director should also provide more directed education for the members of the department. This can be in the form of short-form videos and presentations that can be uploaded via the department’s learning management system (Vector Solutions). Even if the medical director identified content provided on other platforms (YouTube, etc.), the medical director could provide a short introduction of why this is important and what the clinical expectations are. All of this can be uploaded to Vector Solutions for dissemination to the membership. The medical director would be able to address quality issues and educational opportunities for pediatrics, special populations, STEMI, stroke, and trauma patients. The care provided by the members of the department is not only a statement by the City of Troy and Troy Fire Department as to what they provide to the community, but it is a reflection of the medical director’s philosophy of care for the patients who are cared for by their paramedics.

The increasing emergency department (ED) wait times in Troy are a growing concern, significantly impacting the efficiency of our EMS units. Ambulances are frequently delayed at hospitals, unable to transfer patients promptly, which in turn reduces the availability of EMS resources provided by Troy for other emergencies. To address this critical issue, it is imperative that the fire department medical director actively organizes and attends meetings focused on reducing ED wait times. Engaging with REMO, which includes the Regional Emergency Medical Services Council of the Hudson Mohawk Valleys (REMSCO), the Regional Medical Advisory Committee (REMAC), and the Regional EMS Program Agency, will foster collaborative efforts to develop and implement effective solutions. By addressing these challenges, they can enhance patient care and improve the overall responsiveness of our EMS services.[16]

Organizing and attending meetings regarding hospital emergency department wait times is essential for the fire department medical director because these delays directly impact EMS operations and patient care. Prolonged wait times keep ambulances out of service longer,

[16] The American Ambulance Association has guidance on working with hospitals to address these issues in the context of federal legislation. Wall Time Toolkit - American Ambulance Association.

reducing the number of available units for other emergencies and compromising the community's safety. By engaging with regional stakeholders, the fire department medical director can advocate for changes and share best practices that enhance the efficiency of patient transfers, ultimately ensuring better service delivery and improved outcomes for all patients. These meetings may already exist at the hospital level, but if EMS and, by extension, the medical director are not at the table they may be ineffective at best.

10.2. Appropriate Level of Training for EMS Providers

Advanced Emergency Medical Technician (AEMT) may offer the department a mechanism to provide advanced life support services, while helping to control costs. In New York State, an AEMT is a healthcare professional who provides critical advanced life support pre-hospital care in emergency situations. They are found throughout the United States, and they have been a part of the EMS system in New York State for over 50 years. You will find AEMT’s everywhere in New York, from remote wilderness areas to densely populated cities. The role of an AEMT is to provide care beyond the basic EMT, offering advanced life support while maintaining a more streamlined training process. AEMTs are trained to perform interventions such as intravenous therapy, advanced airway management, and the administration of a broader range of medications compared to their basic EMT counterparts. This advanced skill set allows AEMTs to effectively manage more complex medical and trauma situations, providing crucial support during the critical moments before a patient reaches the hospital.

When comparing the certification of an AEMT to that of a paramedic, several key differences emerge. Paramedics receive extensive training, often taking up to two years to complete, which includes in-depth study of anatomy, physiology, cardiology, medications, and advanced procedures such as intubation and EKG interpretation. In contrast, AEMT training programs are significantly shorter, typically taking a few months to complete. This condensed training period allows individuals to quickly enter the workforce and begin making a difference in their communities, which can be a decisive factor for those looking to start their careers swiftly.

One of the key advantages of pursuing AEMT certification over paramedic certification is the balance it offers between advanced skills and training duration. For many individuals, the shorter training period is more feasible, allowing them to begin working and gaining valuable experience sooner. This can be particularly beneficial in areas with high demand for emergency medical services and where there is an urgent need for skilled practitioners. Additionally, the advanced capabilities of an AEMT enable them to provide a higher level of care than a basic EMT.

AEMTs also offer a practical advantage. Many insurance companies, including the Centers for Medicare and Medicaid Services, recognize the advanced skills of AEMTs and allow for billing at the Advanced Life Support (ALS) level for the care they provide. This means that EMS providers can be reimbursed for the advanced interventions performed by AEMTs, making it a cost-effective solution for many emergency medical service organizations.

The AEMT plays a critical role in the EMS landscape, offering a balance of advanced skills and shorter training duration. This makes AEMT certification an attractive option for those looking to quickly enter the field and start providing high-quality care. With the ability to bill for ALS care, AEMTs not only enhance the level of patient care but also contribute to the financial sustainability of EMS providers.

The time to complete AEMT training is broken down as follows:

- 150 classroom hours, where students develop skillful techniques and achieve an in-depth understanding of many areas of medicine, including, but not limited to: cultural competency; anatomy and physiology; patient assessment; intravenous access; emergency pharmacology; airway management; cardiology; trauma; neonatology; endocrine emergencies; neurological emergencies; and gerontology.
- Clinical rotations and field internship are completed AFTER the classroom portion of the program.
- 120 hours in a series of clinical rotations in the hospital setting where emergency procedures are practiced and critical thinking skills are applied to real patients.
- 150 hours of field internship working in the field under experienced preceptors. (https://www.remo-ems.com/education/remo-courses-detail/fall-2024-advanced-emt-original-at-remo/)

On the other hand, the paramedic educational curriculum may take anywhere from one to two years, depending on whether or not the student is earning a certificate or an associate in applied science degree. Following the national standard paramedic curriculum, generally most programs require a minimum of 600 classroom hours, 560 hospital clinical hours, and 440 hours of an ambulance field internship.

The cost of training personnel as a paramedic is considerable, especially in terms of wages and benefits during training, before actively delivering service for the city. Paramedic recruitment and retention are not expected to get easier in the foreseeable future.

Representative Costs for AEMT v. Paramedic Training

Paramedic Tuition Costs:
SUNY Stony Brook: $13,050 tuition and fees
SUNY Hudson Valley CC: $10,998 (FT); $12,948 (PT)
St. John’s University: $10,900 tuition and fees

AEMT

Upstate Medical University: currently restructuring program for 2025. Costs were ~$1,400, but it is anticipated that costs will increase to roughly $2,000 upon the program restructure.

Regional Emergency Medical Organization (REMO), Albany, NY: $2,297 for unaffiliated students, $1,897 for affiliated students.

The paramedic average cost is $11,974 versus an AEMT average of $2,049

One concern raised is the commitment to the AEMT certification within New York State. The New York State Department of Health Bureau of Emergency Medical Services and Trauma Systems has no plans to eliminate the paramedic level of certification in favor of the Advanced EMT (AEMT) level. The paramedic level provides critical advanced life support (ALS) skills, including advanced airway management, medication administration, and cardiac monitoring, which are essential for managing complex medical emergencies. The retention of the paramedic certification ensures that EMS providers can continue to deliver the highest level of prehospital care to patients in need, aligning with the national standards and best practices in emergency medical services. Dropping this certification would significantly reduce the scope of practice and the level of care available in the pre-hospital environment, potentially leading to poorer patient outcomes. This decision reflects the Bureau's commitment to maintaining a highly skilled EMS workforce capable of meeting the diverse and critical needs of New York State's population. This stance is consistent with the overall goal of EMS systems across the United States, to maintain and enhance the quality of emergency medical care. The New York State Department of Health Bureau of Emergency Medical Services and Trauma Systems is a member of NASEMSO, the National Association of State EMS Officials, and this is a core tenet of that organization. (https://nasemso.org/about/overview/)

10.3. Community Paramedicine

One option that emerged during the study was the suitability and feasibility of community paramedicine. We understood this consideration to be driven primarily as a means to reduce the number of 9-1-1 transports currently occurring within the city. There are some significant regulatory and implementation challenges that must be considered. These challenges were revealed during the county’s recent efforts to implement a 9-1-1 diversion program, which saw limited success.

Community Paramedicine is an emerging healthcare model that expands the role of emergency medical services (EMS) personnel, particularly paramedics and EMTs, to provide non-emergency care in the community. The goal is to use their skills outside of traditional emergency responses, focusing on preventive, primary, and follow-up care, helping to bridge gaps in healthcare access, and improving patient outcomes.

Community paramedicine offers increased functionality through expanded scope of practice, and focus on preventive and primary care. Practitioners may visit patients in their homes to manage chronic conditions like diabetes, heart failure, or COPD, to help them avoid unnecessary emergency department (ED) visits, or ensure they are adhering to post-discharge instructions, reducing hospital readmissions. They can provide a bridge in healthcare gaps, especially in rural and underserved communities, integrate with other healthcare providers, and they are cost-effective.

Community paramedics programs have been proven to be successful in reducing requests for EMS that do not require an EMS response, emergency department care that can be provided *in situ*, reducing emergency department overcrowding, and preventing hospital re-admissions by early intervention (Coffman, et al., 2018). The typical services provided in these programs include: chronic disease management (e.g., diabetes, hypertension, sepsis); post-discharge follow-ups after hospitalizations; health education and promoting healthy behaviors; medication management and reconciliation; wound care and monitoring; telemedicine support in remote areas; behavioral health crisis intervention; fall prevention assessments in the home; and vaccinations and public health screenings.

The challenges for community paramedics are as follows:

Funding and Reimbursement Issues. One of the primary reasons community paramedic programs may struggle is the lack of sustainable funding. If the program is dependent on grants for startup, it becomes difficult to sustain the program long-term once that funding dries up without a clear path for reimbursement.

Regulatory and Licensing Barriers. Community paramedicine operates in a grey area in many states when it comes to regulations and licensure. In New York, there is no definition of or scope of practice for community paramedics. Except for a directive on providing vaccinations, the State of New York Bureau of Emergency Medical Services and Trauma Systems currently does not have any operating directives or protocols for community paramedics.

Lack of Integration with Healthcare Systems. Successful community paramedicine programs require strong integration with local healthcare systems, including hospitals, primary care providers, home health agencies, and public health departments. Programs fail due to a lack of collaboration or poor communication between these stakeholders.

Challenges in Proving Cost Savings. Community paramedicine programs aim to reduce emergency department (ED) visits, hospital readmissions, and 911 calls, which can lead to cost savings for healthcare systems and insurers. However, proving these savings can be difficult, particularly in the short term. If the program is unable to demonstrate clear cost savings or improved patient outcomes, stakeholders (like insurers or healthcare systems) might be reluctant to continue supporting the program financially. Some places have used the cost avoidance formula to tout the potential savings, but that is not real money; instead, it is more aspirational savings.

Patient Acceptance and Utilization. Another challenge for community paramedic programs is patient acceptance. Some patients may be unfamiliar with the concept of paramedics providing non-emergency care and may prefer to visit a doctor or go to the hospital.

Operational and Logistical Challenges. Running a community paramedic program requires careful coordination, scheduling, and logistics. Paramedics need to be able to perform home visits, manage care, and keep detailed records. A home visit may take two hours. If Troy is going to attempt to do this while balancing traditional EMS duties, success will be highly unlikely. Community paramedic patients will require consistency and stability. If at any moment they can be diverted by an EMS call or if a home visit is delayed or canceled because of pending EMS assignments, confidence will be eroded.

Cultural and Operational Resistance. Success will be predicated on the involvement and oversight of the person administering the program and the active engagement of the medical director. Successful community paramedicine programs require clear pathways for reimbursement, strong partnerships with local healthcare systems, and the ability to demonstrate measurable benefits.

Additional discussion of community paramedicine within Troy is included in Appendix A8. In short, we believe that it could be a goal, but that considerable coordination and preparatory challenges would need to be addressed before it could proceed. This Appendix also includes a discussion of implications of the newly-passed legislation[17] designed to enable 9-1-1 ambulances to treat patients without transport to a hospital emergency room while receiving Medicaid reimbursement. This is a major step toward enabling reforms for EMS transport and relieving the excess utilization of emergency rooms while enabling financial support of 9-1-1 transport systems.

10.4. Staffing Recommendations

Field Staffing

We foresee the need for staffing both in administration/prevention and in the field. Staffing needs will be impacted by decisions about EMS delivery, but we offer our guidance here. Currently, Medic 3 is staffed as a peak-hour unit relying solely on overtime funds. These funds, currently using temporary ARPA funding, are time limited and will need to be replaced with regular budget monies.

1. *Maintain staffing for Medic 3 from regular operating funds.*[18]

2. *Plan to phase in staff to enable Medic 1 to have dedicated staffing*

3. *Add staff to get each Ladder Company to three personnel on duty.*

[17] https://www.governor.ny.gov/news/governor-hochul-signs-legislation-expand-health-care-access-new-yorkers

[18] The City allocated funding to operate Medic 3 on a 24-hour basis for Winter 2025.

4. *Consider a private BLS ambulance as an opportunity to better manage EMS workload with minimal cost.*

5. *Addition of a Command Aide, who would work with the on-duty Battalion Chief to assist with incident management and serve as a dedicated set of eyes and ears to enhance incident command in the early stages of an incident. The Department has a complex and challenging operating environment, which includes rowhouses and many large older buildings. This position can also assist with the daily administrative tasks of the Battalion Chief.*

6. *Add staff to enable Medic 2 to operate as a dedicated unit during the daytime hours.*

7. *Once personnel currently in the Academy are on shift, determine fill rate for staffing in light of modern workforce trends, and consider hiring additional staff to balance need for overtime.*

8. *Based upon forecasts for growing demand for service, additional resources, particularly for EMS, will be needed if demand continues its recent trends toward an increase. Once units within the system exceed utilization of .25, consideration should be given to additional peak staffing units, followed by 24-hour units. These additions would be triggered by monitoring response times and unit utilization on an annual basis.*

Fire Prevention/Administration Staffing

Based on the size and complexity of the city, we feel the city can justify the establishment of a fire prevention bureau under the direction and management of the Deputy Fire Chief. Ideally, the Bureau would be staffed with a minimum of two members. There is ample justification for the creation of such a bureau given the magnitude of fire risk management needs, including the inspection of properties, especially those with commercial and/or industrial processes that may be outside the realm of the city's building and code enforcement program.

The Department currently does no high-level community-based prevention activity. The nature of its fire problems, being based in residential multiple dwellings, suggests that targeting these residents and landlords could help to reduce the incidence of fires. The fact that fires are increasing is a troubling trend.

The City's Building Department has a robust inspection program and appears to have subsumed many of the duties once performed by the TFD (after they lost staff). Additional resources will enable greater focus and ability to document, measure, and report on a timely basis.

9. *Hire a Captain as a full-time Inspector. Formal position descriptions should be developed for each of the new positions. Assigned staff should hold state certifications in the areas of fire prevention administration and records management, plans review, fire inspections, fire protection-related permitting, public fire safety education, and fire scene investigation.*

10. *Hire a community risk reduction/data specialist whose skills would include data analysis, GIS, and ability to be certified in fire and life safety public education. This person would serve as data manager for NFIRS/NERIS, the vacant buildings program, and assist management with reporting and evaluation. They would also design, deliver, and evaluate intervention programs based on Departmental priorities.*

11. *The Department should partner with community-based organizations to promote the installation of smoke alarms, CO detectors, and offer educational opportunities for city residents, based on their risk of fire or injury.*

12. *The Department should consider the appointment of a full-time training officer as part of the senior management team. The position should be responsible for the coordination of all EMS, fire, rescue, and hazmat certifications within the Department.*

10.5. County Dispatching Fee for Service

The County is in the process of procuring a new Computer Aided Dispatch and Records Management System. It is critical that the TFD develop a list of desired capabilities and reporting that they require and communicate this as soon as possible to the county. The existing contract for service, which we understand is due for renewal shortly, offers a vehicle for undertaking these discussions. They should also include service level standards.
We understand that existing county systems do not readily extract data for Troy. A future system should allow access for TFD representatives to query and acquire basic data as necessary to administer the Department and monitor response times, call processing, and dispatch performance.

In addition, we understand that the TFD plans on moving to the county's radio system. This migration, from an analog to a digital system, is a complex undertaking with considerable end-user training and requirements. This move was of necessity, as the city's fire radio system is beyond its end of life, and the costs of updating it are considered to be prohibitive. This is a once in a generation opportunity and it is imperative that the city has the technical support needed to ensure that the infrastructure is capable of supporting their needs with regard to fire scene operations and in-building coverage.

The city may need its own radio/communications consultant to support and advocate for its needs and robustly participate with the county as its new system is fully-specified and implemented. Decisions made in the coming months will have long-term implications for dispatch and communications services.

Although it was outside the scope of our report, New York State was embroiled in a dispute with the Federal Communications Commission (FCC) in regard to use of 9-1-1 fees on telephone lines. The FCC and New York State differed on the proper use of those fees, with a significant share of the revenue being retained by the State (some of which was distributed back to

localities).[19] [20] Additionally, under New York law, counties are empowered to impose a local tax (tax and surcharge) under various legal authorities.[21] This point is raised for further inquiry as a means to identify potential funding sources to offset the current fees paid by Troy.

10.6. Dispatch Protocols and Support

The County's ongoing procurement and implementation of a new Computer Aided Dispatch (CAD) and Records Management System (RMS) is an opportunity to revisit current procedures in light of best practice and increased adoption of technology.

As we discussed in the report, all front-line units should be equipped with the capability for automatic vehicle status changes, either using geofences (proximity) and push-button status changes (acknowledge alarm, enroute, on scene, etc.) within the vehicle. These technologies will improve accuracy of times recorded and reduce the workload on dispatchers.

Another area for consideration is streamlining the dispatch process for Troy Fire units. At present, the dispatchers give a pre-alert (often while the call-taker may still be on the line with the reporting party). Subsequent to this pre-alert, the dispatcher may manually raise the affected units via the phone line in each station, and then dispatch the incident over the radio. This practice, which has historical precedent, is redundant and time consuming.

It is common practice nationally for units to monitor the radio during the day, obviating the need for a pre-alert or utilizing the house phone to alert units or acknowledge response. After hours, the alerting system can be relied upon to notify units and stations of a response. Station alerting systems may need to be upgraded to interface directly with the new CAD system, but this is a worthwhile expense.

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[19] Rulison, L. "FCC starts case against NY over diverted 911 fees." Albany *Times-Union*. October 2, 2020.

[20] Final Rule on 911 Fee Diversion. Federal Register :: 911 Fee Diversion; New and Emerging Technologies 911 Improvement Act of 2008. 8/17/2021.

[21] All counties are authorized by County Law § 303 to collect up to $.35 for a wireline/VOIP Enhanced Emergency Telephone System Surcharge. County Law §§ 303, 334, 335, 336, 337 authorize the City of New York, Onondaga County, Tompkins County, Madison County, and Tioga County, respectively, to impose a monthly Enhanced Emergency Telephone System Surcharges of up to $1.00. County Law § 336 authorizes Broome County to collect Enhanced Emergency Telephone System Surcharges of up to $1.65. (There are two County Law sections numbered 336.) These local surcharges are managed entirely within the local unit of government. County Law § 305 mandates that the service supplier or suppliers serving a 911 service area act as collection agent of wireline/VOIP surcharges for the municipality and remit the funds to the chief fiscal officer of the county every month.
All counties are authorized by Tax Law § 186-g to impose a surcharge of up to $0.30 per month per wireless device or retail sale of a prepaid device. Broome County may impose an additional $1.10, Madison County may impose an additional $0.65, and Tioga County may impose an additional $1.00. The surcharge is collected by NYS Tax and Finance on a quarterly basis. NYS Tax and Finance, working through the Office of the State Comptroller, redistributes the collected monies to localities.
Tax Law § 186-f imposes a surcharge of $1.20 per month per wireless device or $0.90 per retail sale of a prepaid device. The surcharge is collected by NYS Tax and Finance. The $10 million dedicated to 911 services is distributed by the New York State Division of Homeland Security through formula-driven grants to the counties.

10.7. General Operational Recommendations

At present, TFD opts not to transmit on scene status for full assignments (reported structure fires or other significant emergencies). At the same time, the comparatively large number of units being managed by the dispatcher may overwhelm their ability to capture every status change in a timely manner. We recommend that units call "on scene" for awareness of initial attack crews and the Battalion Chief.

1. *The city should implement electronic status capability for all front-line apparatus so that accurate times can be obtained.*
2. *All front-line TFD vehicles should also be equipped with Automatic Vehicle Location capabilities to enable real-time awareness of unit locations, and reinforce situation awareness for the Battalion Chief on duty and the 9-1-1 dispatchers.*
3. *Continue replacement of Bliss hydrant couplings with a goal of phasing them out within one to two years.*

The use of Bliss couplings is truly unique within the region, and they have been observed to be troublesome for many years.[22] Retiring these couplings by replacing hydrant threads will streamline mutual aid and improve effectiveness of hydrant connections. In the event of major incident, it is conceivable that mutual aid companies would not have necessary adapters.

10.8. Training Needs and Recommendations

The Department's workload is such that on-duty training is becoming increasingly difficult. Junior personnel, who may most need training, are most likely to be riding ambulances and unavailable. In addition, coordinating multi-company training is increasingly difficult without adversely affecting citywide coverage.[23]

Members are united in a desire for better quality and more frequent training.

1. *Revisit the overtime budget for developing a program of multi-company fire-related operational training on a regular basis for all personnel. A goal of this training program should also be to ensure a complement of hazmat and special operations personnel to provide coverage in depth on each shift, with required competencies in-hand when they are assigned to the Rescue Squad.*
2. *Implement continuing training on incident reporting.*

Such training should include use of NFIRS. Training should also include development of policy for recording dollar loss on any fire incident and revision, or updating of incident reports if new information is obtained during the investigation, such as dollar loss, final causal data, or a change

[22] National Board of Fire Underwriters. Report of Cities, volume 11-19, Troy, N.Y. 1905.
[23] During our time on site, we observed a straightforward multi-company drill disrupted multiple times and essentially abandoned due to multiple calls for service.

in medical status of an injured party. The transition to the new National Emergency Reporting Information System (NERIS) will also require significant training.

3. *Develop a voluntary program for officer development, focused initially on Chief Officer development.*

The Department is somewhat insular in terms of training opportunities. Doubtless budget constraints have reinforced this trend, but there are resources and opportunities for free and online training, in addition to management development programs. The National Fire Academy is an important resource that appears to be underutilized. The Executive Fire Officer program is a worthwhile goal for Chief Officers.

4. Resume annual pump tests for all appropriate apparatus per NFPA 1911 *Standard for the Inspection, Maintenance, Testing, and Retirement of In-Service Automotive Fire Apparatus* and ISO Criteria.

10.9. General Administrative Recommendations

1. *Make the case for additional support from county for Hazmat and Special Operations Services.*

The TFD provides hazmat and special operations services to the county. At present, they receive equipment on an ad hoc basis from regional homeland security funds. Basic costs of training and maintaining this capability impose a real cost on the City of Troy, and the city should work to get additional support for the training and maintenance costs of the team.

The TFD estimates that its training costs are approximately $100,000 annually to train and assure backfill for the necessary cadre of personnel to maintain on-duty strength in the event of a response.

2. Develop a plan for maintaining or improving the City's Public Protection Classification.

The most recent ISO rating saw the city score just over the level needed to maintain a "3" rating. Loss of a few points could see the city's rating go down to a "4." This should be avoided, as the city faces a competitive economic environment for attracting businesses which may be sensitive to fire insurance costs. We understand that the Department is already pursuing strategies to secure an improved rating which began after the 2016 rating.

3. Procure staffing software to better manage daily staffing needs and track overtime.

The Battalion Chiefs spend an inordinate amount of time managing shift scheduling and backfill. Manually calling members by seniority, while accounting for any necessary specialized training and their recent work schedule, is complex and cumbersome. Software programs exist specific to public safety that use user-defined rules to automate scheduling and recall in an emergency. This process should be coordinated with payroll staff to assure data can be leveraged for the city's payroll process.

4. *Update City Charter and Code to reflect current practice.*

As part of the project, we reviewed the City Charter for several tasks and found that the legal and organizational structure should be revisited to assure it is appropriate for current operations. Charter §C-40.

As examples, we found that Emergency Management duties within the city are ill-defined, and seem to fall between multiple agencies under the supervision of the mayor.

The Troy Fire Department appears as a Bureau under the Department of Public Safety. City Charter §53.

5. *Update False Alarm Ordinance*

Language around alarm systems appears to pre-date the switch to Renssalaer County's 9-1-1 Center. City Code §113-11.

When analyzing incident data for this study, the project team determined a significant number of annual responses by the TFD were classified as false. Behind EMS related calls, false alarms were the second highest number of incidents annually. Between the years 2019 and 2023, the department responded to a total of 8,920 incidents that were classified as false, averaging 1,784 annually. As indicated in Chapters 5 and 7, false alarms totaled roughly 15 percent of the Department's annual call volume. The vast majority of false alarms were system malfunction and unintentional activations with a smaller number being attributed to malicious intent.

Alarm Ordinance

Many communities have enacted alarm system ordinances that regulate the installation, upkeep, and monitoring of fire and police alarm systems. Most of the laws include fines to serve as an incentive for property owners to maintain their systems, including troubleshooting systems with frequent malfunctions. In 1973, the City of Troy enacted a false alarm ordinance with the most recent revision being in 1987. We understand that the ordinance is not currently enforced. It is recommended the city update its current ordinance, including a revised schedule of fines for false alarms.

The following table provides a comparison of the Troy false alarm penalties to other cities of similar size. Most of the samples reflect a tiered approach to penalties with most of the cities surveyed allowing for a certain number of annual false alarms before fines are levied against the property owner (see Table 10.2).

Table 10.2: Sample False Alarm Ordinances

Table 10.2: Sample of False Alarm Penalties	
City	Fine Criteria
Troy, NY	$50 per false alarm

Binghamton, NY	Each alarm user and police alarm user shall pay to the City a charge for each and every avoidable alarm to which the city responds, in each calendar year, as follows: (1) First two avoidable alarms each calendar year: No charge. (2) Third avoidable alarm each calendar year: $25. (3) Each additional false alarm: $50.
White Plains, NY	Any owner or lessee of property having an alarm device or system of devices on his or its premises, and any user of services or equipment furnished by a licensee under this chapter, shall pay to the city a fee for each and every false alarm to which the police or fire department responds during any calendar year as follows: 1st False Alarm $25.00 2nd-3rd False Alarm $50.00 4th-5th False Alarm $75.00 6th-11th False Alarm $100.00 12 and greater $250.00
Rochester, NY	E. Renewal fees based on use. (1) The annual permit renewal fee shall be based upon the number of avoidable alarms recorded for each alarm user as follows: [Amended 4-15-1986 by Ord. No. 86-96; 6-18-1991 by Ord. No. 91-257; 5-12-1992 by Ord. No. 92-17510-13-1992 by Ord. No. 92-379; 6-14-1994 by Ord. No. 94-171; 6-18-2002 by Ord. No. 2002-201; 1-27-2004 by Ord. No. 2004-38 2; 6-17-2008 by Ord. No. 2008-205; 6-15-2010 by Ord. No. 2010-194; 6-19-2018 by Ord. No. 2018-168 3] (a) For an alarm user with zero avoidable alarms during the preceding year, a renewal fee of $25 shall be charged. (b) For an alarm user with one avoidable alarm during the preceding year, a base permit renewal fee of $25 shall be charged, plus an additional excessive use fee of $5. (c) For an alarm user with two avoidable alarms during the preceding year, a base permit renewal fee of $25 shall be charged, plus an additional excessive use fee of $30. (d) For an alarm user with three avoidable alarms during the preceding year, a base permit renewal fee of $25 shall be charged, plus an additional excessive use fee of $50. (e) For an alarm user with four avoidable alarms during the preceding year, a base permit renewal fee of $25 shall be charged, plus an additional excessive use fee of $90. (f) For an alarm user with more than four avoidable alarms during the preceding year, a base renewal fee of $25, plus an additional excessive use fee of $90 and an additional excessive use fee of $50 for each subsequent avoidable alarm, shall be charged, except that such excessive use fees shall not be charged for systems with any combination of more than 500 pull stations, or heat, smoke, flame or fire gas detectors, or water flow sensing devices, not including sprinkler heads, until the alarm user has had more than 20 avoidable alarms during the preceding year, and such excessive use fees shall not be charged for residential child-care facilities with any combination of more than 100 pull stations, or heat, smoke, flame or fire gas detectors, or water flow sensing devices, not including sprinkler heads, until such a facility has had more than 40 avoidable alarms during the preceding year. At the time of renewal, an alarm user shall receive credit for any amounts paid during the permit year to reinstate a revoked permit.

Cambridge, MA	No fee will be charged for the first three responses in any six-month period, i.e., any period between January 1st and June 30th or between July 1st and December 31st. After the third response in any six-month period, the following fees will be assessed for subsequent responses within that period: Fourth response, $50.00 Fifth response, $75.00 Sixth response, $100.00 Seventh response, $150.00 Eighth and subsequent responses, $200.00
Schenectady, NY	The owner/lessee of any place where there is a persistent false alarm shall be charged an administrative fee by the City of Schenectady of: $25 for the first persistent false alarm, $50 for the second persistent false alarm, $75 for the third persistent false alarm and $125 for each and every subsequent persistent false alarm.

The false alarm ordinance is designed not as a revenue tool, but as a means to incentivize alarm system owners to maintain their systems. A progressive fine structure and a collaborative approach can reduce demands on the Department. Care should be taken to avoid any enforcement that could result in systems being disabled or high-needs buildings being penalized for unintentional activations that can't reasonably be controlled by modern alarm system designs.

6. Continue with replacement of Station 1. We agree with the City's efforts to replace Station 1 in the general area of the existing station.

11. CONCLUSION

The Troy Fire Department operates within a challenging environment of fiscal limits, and a dynamic urban environment with an unprecedented collection of historic and closely-packed buildings. Its population is diverse, with a significant and growing share of older residents and a comparatively high poverty rate. Although social indicators are improving and new development could potentially reverse a trend toward stagnant population growth, the city will remain a challenging environment for delivery of fire and EMS.

The Department has been subjected to a series of cuts during the City's fiscal crisis. The TFD has adapted by emphasizing maintaining service, with mostly fixed resources, as demand for service has steadily increased. The original EMS transport staffing model, which relied on cross-staffing between fire and EMS units, is creating stress on both EMS and fire service delivery as ambulance responses continue to increase.

The creation of the peak-hour Medic 3, funded with overtime, was an important *ad hoc* improvement, later amended to 24-hour coverage for the current winter season. Permanent funding for this initiative is essential to maintaining service levels. However, if demand continues to increase, we expect additional EMS resources will be needed in the future.

The recommendations in the previous chapter will help move the Department from a reactive to a proactive mode. A succession of Chiefs has managed, under scarcity, to make significant improvements in recent years. Nonetheless, these efforts have mainly been designed to maintain basic functions rather than moving toward innovation. This is caused by a combination of staffing and resource limitations – not any limitations of the executive staff.

We hope to position the TFD as a partner and contributor to the City's renaissance, not merely a necessary cost to answer a growing number of 9-1-1 calls. Because of the growth in demand, investments are needed both in operational and administrative capacity, plus up-to-date technology to enable data and performance measurement. This would permit a defensible basis for the city to balance investments in the TFD as it manages its continued path to population and economic growth.

Labor Agreement

Any changes recommended in the report will need to be reviewed for consistency with the labor agreement with the City of Troy Firefighters Local 86 of the International Association of Fire Fighters (IAFF). The current agreement is embodied in three documents, the first of which is the Agreement between the City and the Union, which was effective to January 1, 2013 through December 31, 2016. This agreement was later modified by the Memoranda of Agreement covering 2019-2022, and a Settlement Agreement for several grievances filed by the Union which were resolved on September 7, 2022.

The hope is that the two parties will identify areas of mutual benefit and identify procedures and opportunities to implement productive change for the betterment of the public, Department, and its members. We believe the collective recommendations in this report will improve the level of service to the public, improve effectiveness of the TFD, mitigate growing workloads for personnel, and restore administrative capacity. These changes will allow the TFD to shift from reactive to anticipatory mode, in which it can act to reduce the burden of fire and ill health on the community, engage with complex changes in EMS delivery, better coordinate service delivery both with the county and emergency response partners, and begin to work collaboratively with community organizations to craft innovative approaches to reduce demand for service.

Given the historic underinvestment in the TFD, and the magnitude of needs, we know that prioritizing and identifying resources will be a multi-year process. We recommend that the City form a Task Force to develop concrete steps to identify and plan for fulfilling investments in the TFD. The consideration of steps to reduce hospital wait times should also be part of their agenda. We believe that a 90-day report should be sufficient to begin the implementation process. The Task Force should be composed of TFD, the City administration, and labor organization representatives.

We are optimistic that, by focusing on a shared vision for the future and the overall big goals, agreement on the process and policy can be viewed not as ends in themselves but as tools for moving forward toward enhanced capabilities and managerial capacity. This would enable the TFD to take its place as a leader and leverage its reputation as a hard-working and effective fire department to the next level.